

Technical Report 1044

Leader Attributes and Behaviors Predicting Emergence of Leader Effectiveness

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19961129 043

July 1996



United States Army Research Institute
for the Behavioral and Social Sciences

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Research accomplished under contract
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Virginia Military Institute

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REPORT DOCUMENTATION PAGE

1. REPORT DATE 1996, July		2. REPORT TYPE Final		3. DATES COVERED (from . . . to) August 1990-December 1995			
4. TITLE AND SUBTITLE Leader Attributes and Behaviors Predicting Emergence of leader Effectiveness				5a. CONTRACT OR GRANT NUMBER <u>MDA903-91-C-0131</u>			
				5b. PROGRAM ELEMENT NUMBER 0602785A			
6. AUTHOR(S) Leanne E. Atwater (Arizona State University West), Shelley D. Dionne and Bruce J. Avolio (State University of New York at Binghamton), John F. Camobreco (University of New Hampshire), and Alan W. Lau (University of Maryland)				5c. PROJECT NUMBER A791			
				5d. TASK NUMBER 1001			
				5e. WORK UNIT NUMBER C03			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)				8. PERFORMING ORGANIZATION REPORT NUMBER			
VMI Research Laboratories Virginia Military Institute Lexington, VA 24450		Center for Leadership Studies State University of New York at Binghamton Binghamton, NY 13902		School of Management Arizona State University West Phoenix, AZ 85069			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences ATTN: PERI-RM 5001 Eisenhower Avenue Alexandria, VA 22333-5600				10. MONITOR ACRONYM ARI			
				11. MONITOR REPORT NUMBER Technical Report 1044			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.							
13. SUPPLEMENTARY NOTES COR: Trueman R. Tremble, Jr.							
14. ABSTRACT (<i>Maximum 200 words</i>): This report examines relationships between the leadership of entering leaders and antecedent measures of personality, ability, temperament, interpersonal style, experience, and physical fitness. The data described a sample of cadets/students over the course of their education and military training at a state military college. The primary purpose was to track longitudinally leader development and emergence and to identify individual characteristics and leadership behaviors that differentiated the leadership position and leadership effectiveness attained by the cadets. Results showed that individual characteristics, with some measured at college entry, predicted position attainment and rated (peer) leadership effectiveness. Results also showed that transformational behavior, as well as transactional leadership behavior, characterized cadets emerging as leaders.							
15. SUBJECT TERMS Leadership behavior Transformational leadership Leader development Multifactor Leadership Questionnaire							
16. REPORT Unclassified			17. ABSTRACT Unclassified	18. THIS PAGE Unclassified	19. LIMITATION OF ABSTRACT Unlimited	20. NUMBER OF PAGES 95	21. RESPONSIBLE PERSON (Name and Telephone Number)

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July 1996

FOREWORD

The Center for Leadership and Organizations Research (CLOR), jointly established by the U.S. Military Academy (USMA) and the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), conducts programmatic research on Army-wide priorities in the areas of organizational leadership and leader education, training, and development. The CLOR's major research effort is known as Leadership Education and Development for the 21st Century (LEAD 21). The overall goal of LEAD 21 is development of a longitudinal database as a capability for understanding the leadership development process. LEAD 21 involves the creation of a longitudinal database, begun with the USMA cadets in the Class of 1998, which will allow a description of changes in leadership behavior with organizational progression, as well as identification of experiences contributing to progressive leader development.

Important to this and other leader development research are effective methods for measuring, over time and experience, leadership behavior and behavioral change. The research described in this report concerns a form of leadership that likely becomes increasingly applicable over levels of organizational leadership. This form of leadership is "transformational leadership." The expectation is that compared to conventional forms of leader-follower transactions, transformational leadership inspires followers toward goals transcending immediate self-interest, increased organizational effort, and greater self-development.

The research reported investigated the emergence of leadership behavior and leadership effectiveness in students over the course of their education and training at a military undergraduate college. The research sought to identify the individual characteristics and leadership behaviors that differentiated the leadership positions and leadership effectiveness achieved by the students as college seniors. Results showed that individual characteristics, even measured at college entry, predicted position attainment and rated leadership effectiveness. Results also showed that transformational, as well as transactional, behavior characterized emerging leaders. The findings altogether suggest the appropriateness of a focus on transformational leadership in longitudinal research on variations the effective patterns of leadership behaviors across levels of military leadership.

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ACKNOWLEDGMENTS

The authors express their appreciation to Neil Whitmore and Brig. Gen. Michael Bozeman (USAR), Col. N. Michael Bissell (USA ret.) and Maj. Gen. John W. Knapp (USAR, Ret.), for their efforts in data collection, as well as their continued support and encouragement. Additionally, the fine work of Kathryn Blocher, Kathy Lusitana, and Ilene Sears also is greatly appreciated.

LEADER ATTRIBUTES AND BEHAVIORS PREDICTING EMERGENCE OF LEADER EFFECTIVENESS

EXECUTIVE SUMMARY

Research Requirement:

This report provides the results of research examining how antecedent measures of student leader personality, ability, temperament, interpersonal style, experience, physical fitness, and early leadership behaviors can predict leadership effectiveness 3 to 4 years later in the leader's educational career. The primary purpose of the research was to assess leadership development over time to determine those individual characteristics and leadership behaviors that positively or negatively impact subsequent leader effectiveness.

Procedure:

Data were collected on site at the Virginia Military Institute(VMI) spanning a 4-year period of time. Antecedent measures of personality, temperament, and experience were collected from each focal cadet leader upon entry to VMI. Measures of self-esteem, hardness, physical fitness, and moral reasoning were collected at multiple points in time, as were ratings of leader behavior. Leader effectiveness measures were collected during the cadet's junior and senior years. A multisource/multimethod strategy was used in this longitudinal study to assess the focal leader's attributes, leadership behavior, and effectiveness. Relationships among individual differences, leader behavior, and leader effectiveness were examined using multiple regression and multivariate as well as univariate analyses of variance. Additionally, patterns of development were tracked over time among the focal leader group to present patterns of change distinguishing the most versus least effective leaders based on institutional criteria for leader performance.

Findings:

Results indicated that both individual differences and leadership behaviors measured in earlier years predicted subsequent leader effectiveness. Overall, the best predictors of leader effectiveness were physical fitness, self-esteem, superior ratings of transformational and laissez-faire leadership, and subordinate ratings of transactional leadership (e.g., contingent reward and punishment). Several general patterns of change in the focal leaders over time suggested that physical fitness, moral reasoning, and transformational leadership increased over

time, whereas self-esteem and hardiness fluctuated over time but did not increase between the first and fourth years. In fact, for some leaders, self-esteem and hardiness appeared to drop off at the end of the fourth year. Those leaders displaying the highest self-esteem and physical fitness over time were those most likely to be ranked as most effective by their peers and also those most likely to have attained higher rank in the military rank system. Those leaders displaying more transformational and transactional leadership and less laissez-faire leadership also were evaluated as more effective by their peers.

Utilization of Findings:

During this 4-year longitudinal study of leader behavior and effectiveness, a great deal has been learned regarding how individual differences predict leader effectiveness, as well as the behaviors most conducive to effectiveness. Leaders who scored higher on cognitive ability, self-esteem, physical fitness, BIOLEAD (an empirically validated biographical instrument), the Leader Potential Index (LPI) (an index derived from the California Psychological Index), and who had more prior influence experiences were more likely to assume leadership roles (i.e., hold rank). Those who scored higher on physical fitness and had more prior influence experiences received higher peer rankings. The set of individual difference variables that included physical fitness, self-esteem, hardiness, moral reasoning, cognitive ability, conscientiousness, BIOLEAD, the LPI, and prior influence accounted for significant portions of variance in predicting leader effectiveness. These findings may help in future efforts to identify variables helpful in selecting leaders.

Both the results for individual differences and the differences noted in behaviors of more versus less effective leaders have implications for training. Clearly, those individuals rated as more transformational were more effective. Contingent reward and punishment behaviors also were positively related to leader effectiveness, while noncontingent punishment and laissez-faire leadership were negatively related to effectiveness.

Regarding general trends on the focal leader group over time, physical fitness continually improved over time, and moral reasoning ability also increased. However, while self-esteem and hardiness fluctuated over time, each measure decreased slightly from Year 1 to Year 4. These findings may reflect the pattern desired for military training, where individuals learn to identify their strengths and weaknesses, by providing them with experiences that will challenge their self perceptions. Indeed,

some cadets may have entered VMI with unrealistic self-assessments and have now become more realistic. On the other hand, these results may reflect a trend that indicates that military training (at least in this one environment) is not accomplishing all of its purposes as it had hoped. Individuals are not leaving the military training environment with higher self-reported self-esteem or hardiness than the level they had when they entered VMI. These results suggest that future research should address the impact of military training on perceptions of the self to determine whether trainees are leaving our military institutions at the levels of self-esteem and hardiness that are desired.

With respect to changes in leader behaviors over time, subordinates' ratings of transformational leadership, contingent reward, and contingent punishment behaviors increased somewhat over time for most cadets, suggesting that leaders were learning more effective leadership behaviors. However, contrary to expectations, noncontingent punishment, particularly as rated by the leader's peers, increased during the leader's senior year for those who were not in the highest attained rank groups. This may be indicative of the need for additional leadership training in transformational and transactional leadership.

LEADER ATTRIBUTES AND BEHAVIORS PREDICTING EMERGENCE OF LEADER EFFECTIVENESS

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LEADER ATTRIBUTES AND BEHAVIORS PREDICTING EMERGENCE OF LEADER EFFECTIVENESS

INTRODUCTION

The effective Army officer of the 21st century will be required to lead in ambiguous and complex circumstances. A broad range of capabilities will be required of officers as well as their followers. Due to budget cuts and constraints, leaders will be required to do more with less. Increasing leadership capabilities will be demanded.

Our current understanding of how such effective leaders are developed in the military needs to be enhanced to augment U.S. military preparedness and overall effectiveness. In order to optimally understand the leadership development process, leaders need to be studied over time.

Howard and Bray (1988) were the first to demonstrate that psychological measures administered to young managers just beginning their careers could predict eventual levels of advancement at AT&T. Yet, few studies since have attempted to expand this knowledge base with additional longitudinal research. As Bass (1990) suggested "leadership development is a continuing process. Thus, researchers need to learn a lot more about how experience with subordinates, peers, superiors, as well as family and friends, shapes one's subsequent performance as a leader" (Bass, 1990, p. 911). The present study attempted to gain additional understanding of the leadership development process in a military setting. The ultimate goal of this study was to provide the U.S. Army and others with information relevant to developing effective leaders. A better understanding of the leader development process could positively impact leadership training and selection.

It was the intention of this study to track the leadership and development of a group of young leaders in a military school from matriculation to graduation. Biographical data, personality measures, and other individual differences were measured at matriculation. The development of self-esteem, hardiness (stress tolerance), moral reasoning, and physical fitness, were then tracked over a 4-year period and compared for the most and least effective leaders. In general, we expected more effective leaders to have more positive characteristics (e.g., higher self-esteem) and for the changes over time to be in a positive direction (e.g., increases in self-esteem over time). Additionally, the ability to predict leadership effectiveness from early measures of individual differences was assessed.

A second, related purpose was to track leadership behavior over time for the most and least effective leaders. We assessed the extent to which the uses of transformational and transactional (contingent reward and punishment) leadership, noncontingent punishment, and laissez-faire leadership were predictive of peer ratings of leader effectiveness and attained

rank. Additionally, we assessed the patterns of the leadership behaviors used over time by the most and least effective leaders.

INDIVIDUAL DIFFERENCES PREDICTING LEADER EFFECTIVENESS

Many of the early studies of leadership emergence and effectiveness concentrated on linking leader personality traits to various leader effectiveness or performance measures (Bass, 1990; Yukl, 1994). Generally, clusters of characteristics seemed to differentiate effective from ineffective leaders, though no specific trait or characteristic could be deemed essential. Among the characteristics found to be of clear consequence to leadership were cognitive ability, conscientiousness, self-confidence, energy/activity level, values, and tolerance for stress (Bass, 1990). Lord, DeVader and Alliger (1986) in their meta-analytic review of the leader trait literature concluded that traits did account for appreciable variance in leadership perceptions. They also suggested using a set of traits to predict leadership would be a promising approach.

Additionally, with the exception of the longitudinal work done by Howard and Bray (1988), the vast majority of leader trait-performance relationships have been tested using cross-sectional designs, rather than predictive designs. In this study, we were interested in determining the extent to which traits measured early in the training process (i.e., early in the first year at a military college) could predict leadership emergence and effectiveness years later. The traits previously shown to be important to leadership and included for assessment are described below.

Cognitive Ability

"Evidence continues to mount that generalized intelligence or mental ability is associated with a person's performance as a leader or manager" (Bass, 1990, p. 98). Research has demonstrated that intelligence, or cognitive ability, is highly correlated with leadership. Results of a meta-analysis of 18 studies of leadership conducted by Lord et al. (1986) indicated that the aggregate correlation between intelligence and leadership was .50. These studies were done on diverse populations that included students, managers, military cadets, and others. Lord and Hall (1992) argued that cognitive ability levels determine the extent to which leaders are more successful at anticipating and recognizing problems, thus improving their ability to influence others.

Conscientiousness

Conscientiousness includes characteristics such as having a sense of purpose, and being responsible and persistent. In early studies, (cf. Cox, 1926; Drake, 1944; Webb, 1915;) conscientiousness and leadership were reported to be correlated between .21 and .53. Later work by Mount and Barrick (1993) reported that conscientiousness was the best predictor of occupational performance in a series of studies spanning 36 years. Bentz (1990) reported that conscientiousness and emotional stability were predictive of advancement rates to senior executive ranks at Sears. Similar patterns also have been reported previously in the leadership literature by Stogdill (1948; 1974), who found that conscientiousness was positively related to leader emergence.

Leader Potential Index

The California Psychological Inventory (CPI) was developed to assess traits and interpersonal behaviors that arise from and operate in the domain of the social environment. Leadership is one of these interpersonal behaviors, and items from the CPI have been validated as capable of predicting leadership (Gough, 1969; 1987).

Several studies have provided a basis of support for the utility of using the CPI for predicting leadership. Gough (1969) provided empirical support for optimum weightings of CPI scales successfully differentiating leaders from nonleaders. The five scales he identified were dominance, self-acceptance, sense of well-being, good impression and achievement via independence. Four of the five scales were positively weighted, that is higher degrees of the trait were predictive of leadership. Good impression (social desirability) was negatively weighted in this predictive grouping of scales. This weighted subscale is referred to as the Leader Potential Index (LPI). Gough (1990) further confirmed the validity of the LPI in predicting leadership with a sample of male cadets at West Point.

Self-Esteem

Almost all authors reporting data on the relationship of self-confidence to leadership were uniform in the positive direction of their findings. Andrews (1984) showed that among undergraduates, those with high self-esteem were more likely to emerge as leaders of their groups, and were more likely to be rated as displaying effective leadership behaviors. Self-esteem in leaders appears to be related to the ability to accept people as they are, to trust others, and to be able to work without the constant need for approval or recognition (Bass, 1990).

Hardiness

The survival of a group is often dependent on a style of leadership that enables members and subgroups to work together toward a common purpose, even in times of crisis or stress. In order for the leader to help the group through crisis, he or she must have a high personal tolerance for stress. Hardiness is a self-report measure of an individual's social, physical and psychological resources for coping with stress. One's ability to cope with stress has been shown to predict which managers can best withstand stress without becoming ill or debilitated (Kobasa, 1979; Kobasa, Maddi & Puccetti, 1982). The stressful nature of a military environment provides an optimal context to study how hardiness impacts an individual's effectiveness. We would expect that those with the highest levels of hardiness would possess the greatest resources to be able to lead others effectively.

Moral Reasoning

Moral reasoning refers to how individuals structure and interpret the meaning of events to which they are exposed (Kegan & Lahey, 1984). Fundamental to operationalizing moral reasoning is the choice people make when confronted with dilemmas and the standards they use to make that choice. Kegan and Lahey (1984) suggested that moral reasoning levels be interpreted along a continuum. At the lowest level, individuals frame events in terms of being centered around themselves, with personal goals and agendas serving as the individual's frame of reference. Kohlberg (1981, 1984) also referred to the lowest stages of moral reasoning as those in which the individual's sense of morality centers around self-interest. Those leaders who are self-focused narcissistic, and at the lower levels of moral reasoning would be less interested in subordinate improvement, and would be more likely to view followers as objects to be manipulated or exploited.

In both Kegan and Lahey's and Kohlberg's models, as individuals progress to more mature stages of moral reasoning or perspective-taking capacity, they become more able to transcend self-interest for the common good. Additionally, at these higher stages of moral reasoning, the individual focuses on equity, dignity, justice and human rights (Kohlberg, 1981; 1984). They are able to exhibit empathy toward others. Given the above, we expected those leaders at higher levels of moral reasoning to emerge as more effective leaders, and to be more likely to have attained positions of higher rank.

Physical Fitness

Athletic ability and physical prowess have been shown to be associated with leadership status in boys' gangs and groups (Bass, 1990). Cox (1926) found athletic prowess and energy output to be associated with military leadership, but not with leadership in other contexts.

In support of the connection between athletic ability or performance and leadership in military settings, Rice, Yoder, Adams, Priest, and Prince (1984) in a study of male cadets at the U.S. Military Academy reported a positive correlation between physical aptitude and being viewed as having leadership ability. Atwater and Yammarino (1993) found athletic participation to be the best predictor of follower ratings of transformational leadership among midshipmen at the U.S. Naval Academy. Yammarino, Spangler and Bass (1993) also reported a significant relationship between military performance scores (which are based partly on physical conditioning) obtained at the Naval Academy and ratings of leadership obtained ten years later among naval officers.

Physical fitness at VMI where this study took place is considered to be a critical measure against which all cadets are compared for leadership potential. This may be in part because it represents persistence and hard work, as well as a higher sense of self-worth. Anecdotal evidence collected in interviews with cadets by the principal investigators suggested that those cadets who were in the best physical shape were more highly respected by other cadets. Conversely, cadets often made disparaging comments about more senior cadets who exhibited poor levels of physical conditioning as it was a sign of laziness and complacency. Additionally, they indicated that those cadets were not being effective role models.

Prior Influence Experiences

Over the last thirty years, a considerable amount of work has been published examining the use of life history and biodata for predicting a whole range of subsequent behavior, including leadership (Mumford, Stokes & Owens, 1990; Stricker, 1989). A core argument in this literature is that past behavior and experiences capture characteristic ways that people interact and also provide some clues to understanding the development of individual personalities, interests and abilities (Mumford & Stokes, 1992). Since past experiences condition how individuals respond to future events, they establish a behavioral framework or set of responses, which an individual can employ when confronted with similar situations.

A number of authors have provided evidence showing that life history items can be developed and scaled to capture performance relevant constructs, such as leadership (Kuhnert & Russell, 1990; Mumford, Uhlman & Kilcullen, 1992; Schoenfeldt, 1989). This approach starts with a judgmental grouping of items with relevance to the performance domain being measured. Following the generation of items based on these qualitative judgments, empirical scales are developed and validated.

Because leadership is essentially influencing others, prior experiences individuals have had where they demonstrated influence with others could be expected to predict leadership performance at a later time. We included measures of prior influence in a biodata instrument administered to cadets with the expectation that such prior experiences would predict subsequent leader behavior and effectiveness.

Timing of Data Collection

Personality and biodata constructs were expected to remain fairly constant over time, and thus were measured once, when the cadets entered VMI. Self-esteem, hardiness, physical fitness and moral reasoning were expected to change over time, and these changes were expected to impact leadership development and effectiveness. Change over time was expected largely because the military training provided had as its goals to create leaders with high degrees of self-esteem, stress tolerance, physical conditioning, and moral integrity. Thus we chose to assess these four measures at various points throughout the four years.

LEADER BEHAVIORS PREDICTING EFFECTIVENESS

A broader or "full-range" of leadership, that is, transformational, transactional and laissez-faire leadership were the focus of this study (Bass & Avolio 1993). Due to the nature of the environment and the frequent use of noncontingent punishment, noncontingent punishment also was assessed over time. The initial measures included four components of transformational leadership, (i.e., individualized consideration, inspirational motivation, idealized influence and intellectual stimulation), two components of transactional leadership (contingent reward, and contingent punishment), laissez-faire leadership, and noncontingent punishment. As early results indicated the components of transformational leadership were highly correlated, they were combined into one construct. As such, five measures are discussed in this report: Transformational leadership, contingent reward, contingent punishment, noncontingent punishment, and laissez-faire leadership. These are summarized in the next four sections. Noncontingent reward (rewarding others regardless of their level of performance or

accomplishment), while part of the contingent and noncontingent behaviors generally measured, was not reported in this study because it was observed very infrequently. That is, survey scores and critical incidents recorded indicated that leaders very rarely demonstrated noncontingent reward (Avolio et al., 1996).

Transformational Leadership

The concept of transformational leadership and its effectiveness have been discussed by a number of contemporary leadership authors (Bass, 1985; Yukl, 1989; House, 1977; Podsakoff, McKenzie, Moorman & Fetter, 1990; Conger & Kanungo, 1987, 1988; Trice & Beyer, 1986). Bass and Avolio (1993) suggested that transformational leaders are characterized by a higher form of leadership influence than transactional leaders. (For a thorough description of a full range of leadership see Avolio et al. (1996)). For example, transformational leaders do not necessarily take problems as given. They question assumptions underlying problems, they focus on increasing follower potential, and they build a collective sense of purpose. As such, transformational leaders are distinguished from transactional leaders who may simply focus on resolving a problem to achieve the standard objectives. Generally, transformational leaders have been shown to be more effective than transactional leaders, getting followers to exhibit higher levels of effort and performance (Bass & Avolio, 1993).

Numerous studies have supported the contention that transformational leadership is related to effectiveness. Specifically, transformational leadership reportedly correlated between .50 and .90 with various measures of organizational and leader effectiveness (Bass & Avolio, 1993). Results of a recent meta-analysis from 39 studies using the Multi-Factor Leadership Questionnaire (MLQ) and measures of leader effectiveness also supported the positive relationship between transformational leadership and work unit effectiveness (Lowe, Kroeck, & Sivasubramaniam, 1995). Transformational leadership also was found to be more highly associated with work unit effectiveness than contingent reward.

It is noteworthy that in military settings, transformational leaders have been rated by followers as being the most effective leaders, and have been found to be more likely to be promoted to higher rank than individuals exhibiting other leader styles (Atwater & Yammarino, 1992; Yammarino & Bass, 1990). Clover (1989) found transformational leaders more likely to be rated as role models. Curphy (1992) found transformational leaders achieved higher performance with their cadet teams. Transformational leaders also have received higher ratings of leadership in simulated combat exercises than nontransformational

leaders (Avolio, Atwater & Lau, 1993). Thus, we expect transformational leadership to be positively related to leader effectiveness.

Contingent Reward

While much previous research has investigated the effects of punishment on satisfaction and performance of subordinates (Bass, 1991), few studies have tested relationships between leaders' uses of contingent reward and their ratings of effectiveness. Singer (1985) found a correlation of .71 between contingent reward and effectiveness in a study of corporate executives. Waldman, Bass, and Einstein (1985) reported a correlation of .48 between contingent reward and effectiveness in a study of managers from a group of high-tech companies. Furthermore, Bass (1990) proposed a model suggesting leader contingent reward behavior leads to efforts to comply with a leader's requests in order to gain rewards. Compliance and rewards then lead to follower satisfaction as well as continued effort to comply. If we assume that followers' effectiveness and compliance with the leader's requests have a positive impact on leader effectiveness, we could expect leaders using more contingent reward to receive higher evaluations of effectiveness since their followers would be more effective.

Waldman, Bass and Yammarino (1990) found that contingent reward used by leaders with their followers was positively related to superiors' evaluations of the leaders' performance. Thus, we expect contingent reward also to be positively related to leader effectiveness.

Laissez-faire Leadership

Bass (1990) describes laissez-faire leadership as a inactive form of leadership, actually non-leadership. Laissez-faire is the absence or avoidance of leadership when it is needed. Bass and Avolio (1989) reported a range of correlations from -.29 to -.60 between laissez-faire leadership and the leader's contribution to the effectiveness of the group. Likewise, Yammarino and Bass (1990) reported significant negative correlations between laissez-faire leadership and superiors' evaluations of the performance of naval officers. Hater and Bass (1988) found negative relationships between laissez-faire leadership and effectiveness among civilian managers. Thus, we expect laissez-faire leadership to be negatively related to leader effectiveness.

Contingent and Noncontingent Punishment

The concept of punishment appears in a number of models of leadership. Propositions relating leader effectiveness to punishment styles of leadership are prominent in many leadership theories, including House's (1971) Path-Goal theory, Hollander's (1978) transactional approach, as well as Podsakoff and colleagues' transactional contingent reward/punishment styles model (cf. Podsakoff, Todor, & Skov, 1982; Podsakoff, Todor, Grover, & Huber, 1984). The use of punishment or coercive power also has been shown to occur in a wide variety of organizations (cf. Bass, 1990; Hollander & Offerman, 1990). Miner and Brewer (1976) found that 83 percent of the companies they surveyed used punishment or threats of punishment to deal with employee problem areas. Sims (1980) suggested that managers in work organizations also "eventually do use aversive behavior [punishment] even though they may be reluctant to admit it" (p. 57).

In the military and other settings, the use of punishment has been associated with the development of stamina, stress tolerance and self-confidence. The use of punishment during indoctrination training can be widely observed in the Army as well as the other U.S. military branches. Consistent with this, interviews, observations and critical incidents of leadership at VMI indicated that punishment was widely used during military drills to increase stress tolerance and physical conditioning.

Generally, prior research has reported that contingent punishment, punishment that is delivered based upon specific standards for the subordinate's poor performance or unacceptable behavior, is more effective and more satisfying to subordinates than noncontingent punishment, delivered arbitrarily (Podsakoff et al., 1982; Cherrington, Reitz, & Scott, 1971). Korukonda and Hunt (1989) reported that the use of contingent punishment resulted in greater improvements in performance than either noncontingent punishment, or noncontingent reward. Korukonda and Hunt (1989) argued that contingent punishment is associated with a clear message of disapproval, thus motivating the target individual to enhance his or her performance. Arvey and Ivancevich (1980) also suggested that in some situations punishment can be motivational and can actively improve the performance of target individuals.

Korukonda and Hunt (1989) reported that the use of contingent punishment resulted in greater improvements in performance than either noncontingent punishment or noncontingent rewards. Bass (1990) has suggested that contingent punishment may lead to compliance in order to avoid punishment, although it also can have the opposite effect, reducing compliance and motivation if followers feel hostile toward the leader using punishment.

In terms of the impact of contingent punishment on perceptions of leader effectiveness, we believe there are a number of reasons contingent punishment will likely contribute to greater leader effectiveness. First, contingent punishment is delivered in response to poor performance or unacceptable behavior, with the intention of improving subsequent behavior. Therefore, it is likely to be seen by subordinates as useful. If leaders clarify standards for acceptable and unacceptable behavior and adhere to those standards by using punishment when standards are not met, then we expect such leaders to be evaluated as effective. Second, and related to our first point, equity theory (Adams, 1965) as well as principles of justice (Furby, 1986) rest on the assumption that individuals make contributions or investments, and then judge what they should fairly receive in return for their investment. Good and poor performers should therefore receive different outcomes to maintain equity e.g., poor performance should be punished and good performance should not be punished. Because contingent punishment follows unacceptable performance or behavior, it is likely seen as fair and just (Ball, Trevino & Sims, 1992). As stated by Korukonda and Hunt, "the best remedy against poor performance appears to be contingent punishment" (p.320). Third, earlier work has consistently demonstrated that active styles of leadership are seen as more effective than passive styles (Bass & Avolio, 1990). For example, the use of active management-by-exception, where the leader monitors for mistakes and corrects subordinates when mistakes occur, has been related to higher levels of leader effectiveness (Yammarino & Bass, 1990). Contingent punishment is clearly active leadership, and therefore could be expected to contribute positively to the leader's perceived effectiveness. Fourth, similar to McClelland's (1975) view of socialized leaders, we expect that leaders who use contingent punishment are likely to be more self-controlled, thus requiring greater amounts of energy to layout the contingencies and follow through on the rules and boundaries of appropriate behavior. Such leaders are less likely to be impetuous and arbitrarily aggressive, and consequently should be perceived as more effective in their role as leaders.

Noncontingent punishment has been shown to be negatively related to subordinate performance (Podsakoff et al., 1984). Similarly, the use of noncontingent punishment in laboratory settings has been shown to promote depression and lower levels of effort among those punished (Seligman, 1975). Lower follower performance is likely to result from feelings of learned helplessness where the recipient of noncontingent punishment feels no amount of effort will be sufficient to reduce the frequency of punishment (Podsakoff et al., 1984). Earlier research has shown that noncontingent punishment used by leaders was related to lower subordinate performance as well as the leader being seen as a "bad leader" (Korukonda & Hunt, 1989; Podsakoff et al., 1984). We would expect leaders to be

evaluated, at least in part, on the basis of the effects their behavior has on followers. As such, because noncontingent punishment is expected to have a negative impact on followers' reactions and performance, and because noncontingent punishment is likely to be viewed as unjust, we would expect leaders who use noncontingent punishment to be rated as less effective.

METHOD

Organizational Context

The context of the study was the Virginia Military Institute, a military college in which all cadets live in barracks during the school year. Approximately 1300 male cadets attend the school. A dominant structure of the school is the Cadet Corps, which comprises the entire student population. The members of the upper classes of the Cadet Corps are responsible for training the cadets in lower classes. The educational philosophy of the college is to provide a high quality undergraduate education within a system of military training and discipline. A central theme and focus of the educational system is leadership development.

The structure and function of the Cadet Corps provide cadets with individual leadership opportunities and responsibilities. The Cadet Corps is organized as an Army infantry regiment with three battalions comprised of three companies in each battalion (and a regimental band company). Each company comprises approximately 120 cadets, 25 to 35 from each class. The upper class cadets are charged with the maintenance of military proficiency and the administrative duties necessary to the operation of a military unit.

Subjects

The 401 cadets who enrolled at VMI in August 1991 comprised the initial sample of focal cadets. At the end of the four years, 236 cadets remained at VMI. The 236 cadets comprise the sample reported on in this study. Throughout the four years, different groups of cadets, superiors, subordinates and peers provided leadership and effectiveness ratings of the focal cadets. Each of these rater groups is described below.

Subordinate Ratings. Focal cadets were first rated on leadership during their sophomore year. At this time, the freshmen rated their leadership. Focal cadets were rated by the sophomores when they were juniors, and by sophomores and juniors when they were seniors.

Superior Ratings. Focal cadets were rated on leadership by juniors and seniors when they were sophomores, and by seniors when they were juniors.

Peer Ratings. Focal cadets were rated by their peers on leadership when they were seniors. Peers also provided rankings of each others' leader effectiveness during their senior year.

Measures and Data Collection Procedures

Cognitive Ability. Cognitive ability was assessed by using Scholastic Aptitude Test (SAT) scores (College Entrance Examination Board, 1989). The SAT was taken by each cadet as part of his admission requirements. SAT Verbal scores were used as a measure of cognitive ability.

Early Life Experience. A 22-item biodata measure of life experiences and behaviors was used, called BIOLEAD. The measure drawn from a 73-item biodata questionnaire tested at West Point, was empirically keyed to ratings of military performance and leadership during Cadet Basic Training and Cadet Field Training at West Point (Mael & Hirsch, 1993).

The methodology used to key BIOLEAD was done in the following manner. First, means on the criterion for each biodata item response were calculated. Next, a 0, 1, or 2 was assigned to each response alternative. If the response fell within .05 of the mean, it was considered to be at the mean and was assigned a value of 1. Responses with means greater than .05 above the mean were assigned a 2, while responses with means greater than .05 away from the mean were assigned a 0. If responses were not more than .05 away from the mean, but two heavily-endorsed responses were further than .05 from each other, those responses were recoded 0 and 1, or 1 and 2, depending on whether the higher or lower choice was closer to the mean. (For additional details on methodology, see Mael & Hirsch, 1993). The biodata measures necessary for BIOLEAD were administered to all VMI cadets during the first week of the focal cadets' first semester.

Prior Influence Experiences. The Life History Questionnaire, also administered during the first year to focal cadets at VMI, was developed based on the early work of Owens (1968) and Owens and Schoenfeldt (1979), and more recently Stokes, Mumford, and Owens (1989). This survey was developed using transformational leadership theory as a conceptual model to guide the creation and inclusion of items that are considered to be linked to the development of leadership, particularly transformational leadership. Nine items from the Life History Questionnaire assessed experiences where focal cadets had demonstrated influence with others. These items were selected by two independent raters on the basis of their content representing

the types of influence experiences described by Mumford, O'Connor, Clifton, Connelly, & Zaccaro (1993). Specifically, each rater identified items that reflected the following criteria: (a) participation in or an attraction to situations where the expectation is to influence others, or (b) behaviors indicative of an effective implementation of influence attempts. Each of the nine items met one of the aforementioned criteria, and the scale created (Prior Influence Experiences) had an internal consistency alpha value of .70.

Conscientiousness. The California Psychological Inventory (CPI) was administered to focal cadets the first week of their freshman year. The 20 CPI scales (see Gough, 1987) were factor analyzed, attempting to replicate the "Big 5" personality factors, as suggested by Digman (1990). While factors representing the Big 5 did not clearly emerge, a composite factor representing conscientiousness was identified. The scales loading highest on this composite factor, while not loading on any other factors, were responsibility, self-control, achievement via conformance, and socialization. These four scales were included in the analyses as a measure of each focal cadet's level of conscientiousness. The alpha value for this composite scale was .80.

Leader Potential Index. The LPI subscale of the CPI also was included in our analysis. A high score on the LPI suggests the individual has a talent for leadership and is dominant, self-confident, aggressive, rational, logical, clear-thinking, demanding, ambitious, and possibly egotistical. A low score suggests the individual has a potential for leadership that is below average. These individuals are cautious, careful, shy, unassuming, patient, peaceable, submissive, and too cooperative.

The scales used to measure the LPI and conscientiousness measures did not overlap. There was no empirical redundancy between the measures used to represent these two respective constructs.

Physical Fitness. The long-term objective of the physical fitness test is to habituate cadets to exercise and to establish life-long standards for physical fitness. Scores on physical fitness were collected each year throughout the focal cadets' four years at VMI. This physical fitness test is the VMI fitness test which is given to each cadet semi-annually (in November and April) as part of their physical education grade. This test consists of three events, including pull-ups (maximum number done), situps (maximum number done in two minutes) and a one and one-half mile run for time. Scores are based on standardized tests in the aforementioned three events. The test score is the sum of the individual events and can vary from 0 to 300. Scores ranged from 105 to 295. Fitness scores from the Fall of 1991, 1992, 1993 and Spring 1995 were used as Time 1,2,3, and 4

measures. The average fitness score at each time period for all cadets completing the test was: Time 1: 188.43; Time 2: 207.79; Time 3: 220.58; Time 4: 213.49.

Self-Esteem. Ten items measuring self-esteem were taken from the Rosenberg Self-esteem Scale (Rosenberg, 1965). These ten items measure self-respect and the extent to which an individual considers himself personally worthy. Self-esteem was measured each year. The average score at each time period for all focal cadets completing the test was: Time 1: 3.35; Time 2: 3.21; Time 3: 3.28 and Time 4: 3.21. Coefficient Alpha values for these four periods were .81, .88, .85 and .86, respectively.

Hardiness. A measure of a cadet's ability to cope with stress was administered at four time periods throughout the four-year period (see Kobasa, et al. 1982). This test contains 35 items that measure three aspects of hardiness; one's level of commitment to the stressful situations they face, one's perceived control in dealing with those situations and whether the situation is seen as a threat or a challenge. The hardiness items were rated on a ten-point scale with a higher score representing a higher level of hardiness. The average hardiness scores at each time period on a scale of 1 to 10 for all focal cadets completing the measure were: Time 1: 7.11; Time 2: 7.11; Time 3: 7.31; & Time 4: 6.92. Coefficient Alpha values for these four time periods were .92, .91, .90, and .94 respectively.

Moral Reasoning. The Defining Issues Test (DIT) (Rest, 1986) was used to assess the cadets' levels of moral reasoning. The DIT is considered to be the most prominent objective test of cognitive moral development. The test consists of six hypothetical ethical dilemmas and a list of considerations for determining what is the right choice to make. Respondents must decide the action they would take and the reason they made that decision. Subjects rank the four most important considerations and these rankings are used to create the subject's moral reasoning score. Tests are scored at the Center for Ethical Development and results are sent to researchers. The test is scored on a scale ranging from 0 to 95, with a high score representing a higher level of moral reasoning. This test was administered during the first week of the first semester, and again in the third and fourth years. The average score for the focal cadet class was 28.8 at Time 1, and 33.03 and 32.87 at Times 3 and 4. McNeel (1994) reports average scores for students from longitudinal college samples as 37.2 for freshman and 46.2 for the same students as seniors. This indicates that compared to national norms for male college students, the general level of moral reasoning for the focal cadets in this study was lower.

Five dimensions of leadership were measured for the purposes of this study. These were transformational leadership, contingent reward, contingent punishment, noncontingent

punishment, and laissez-faire leadership. All items were rated on a 5-point scale ranging from 0="Not at all" to 4="Frequently if not always." Table 1 presents descriptive statistics for subordinate and superior leadership ratings for the three years leadership data were collected, i.e., during the focal cadets' sophomore year (Time 2) junior year (Time 3) and senior year (Time 4).

Transformational Leadership. Transformational leadership was measured using the Multi-Factor Leadership Questionnaire (MLQ) form 5R (Bass & Avolio, 1990). This survey measures transformational, transactional and laissez-faire leadership. The first and second admissions of the MLQ, administered when the focal cadets were sophomores (Time 2) and juniors (Time 3), included a 47-item transformational leadership scale, including items from each of the components of transformational leadership (i.e., individualized consideration, inspirational motivation, intellectual stimulation, and idealized influence). A typical transformational item (subordinate form) was "He instills pride in what I do." When a cadet was rated by more than one subordinate, superior, or peer, the scores within that group were averaged. As such, each cadet received a scale score from each rater group at each time period representing the average of the 47 items.

When focal cadets were seniors (Time 4) a reduced transformational scale was used for efficiency. This scale was derived from confirmatory factor analyses reported in Avolio et al. (1996). This scale included 16 items, four measuring each of the components of transformational leadership. Again, the items were averaged creating a transformational score for each focal cadet from each rater group (i.e., subordinates and peers).

To assess the comparability of the 47- and 16-item scales, a correlation was computed between the 16 items used in the later version (mean=2.04; s.d.=.61) as rated by subordinates at Time 2 and the 47 items rated by subordinates at Time 2 (mean=2.02; s.d.=.66). The resulting correlation was .96. A similar correlation was computed for superior ratings at Time 2 using the 47 items (mean=2.17; s.d.=.74) and the 16 items (mean=2.12; s.d.=.84). This correlation was .96. As such, we believed the shortened version of the transformational scale was representative of the longer version and therefore the two were treated as comparable.

Contingent Reward. Items measuring contingent reward were adopted from Podsakoff, Todor, and Skov (1982). The contingent reward scale from the MLQ was not used due to the high intercorrelation between contingent reward and transformational leadership when both were measured using the same scale at the same time. Six items assessed contingent reward at Times 2 and 3. A shortened two-item scale was used at Time 4 for efficiency.

Table 1

Descriptive Statistics for Subordinate and Superior Leadership Ratings at Three Data Collection Periods

Subordinate Leadership Ratings	Time 2				Time 3				Time 4			
	M	SD	N	α	M	SD	N	α	M	SD	N	α
Transformational	2.02	.66	168	.97	2.27	.77	134	.97	2.54	.86	124	.96
Contingent Reward	1.93	.82	126	.75	2.11	.91	125	.89	2.59	1.02	124	.88
Contingent Punishment	1.90	.91	126	.77	1.98	.77	125	.87	2.25	.74	124	.77
Noncontingent Punishment	1.68	.90	125	.73	1.51	1.10	124	.88	1.56	1.07	124	.87
Laissez-faire	1.53	.59	164	.83	1.54	.84	135	.88	1.41	.98	123	.85
<hr/>												
Superior Leadership Ratings	M	SD	N	α	M	SD	N	α	M	SD	N	α
Transformational	2.17	.74	133	.97	2.20	.69	128	.97	2.34	.93	69	.96
Contingent Reward	n/a	n/a	n/a	n/a	2.33	.80	155	.91	2.21	1.06	69	.88
Contingent Punishment	n/a	n/a	n/a	n/a	2.21	.79	154	.86	2.15	.80	69	.75
Noncontingent Punishment	n/a	n/a	n/a	n/a	1.22	.84	157	.75	1.64	1.14	69	.90
Laissez-faire	1.65	.74	137	.84	1.59	.84	128	.90	1.52	1.00	69	.84

NOTE: N refers to the number of focal cadets who had aggregated scores from superior or subordinate ratings.

The six-item scale (mean=1.93; s.d.=.82) and the two items (mean=1.94; s.d.=.73) used in the Time 4 scale were correlated using data for subordinates at Time 2. The resulting correlation was .93. A similar analysis was conducted for superiors at Time 3 using the six-item scale (mean=2.33; s.d.=.80) and the two items used at Time 4 (mean=2.27; s.d.=.89). The resulting correlation was .94. As such, we believed the shortened version of the contingent reward scale was representative of the longer version and, therefore, the two were treated as comparable. A typical item was "He gives followers recognition when they perform well." A cadet received a contingent reward score based on the average of these six (or two) items. Again, if cadets were rated by more than one evaluator within a rater group (e.g., more than one superior or subordinate) the scale scores were averaged across raters within rater group.

Contingent Punishment. Items measuring contingent punishment were chosen from Podsakoff, Todor, and Skov (1982). Five items assessed contingent punishment at Times 2 and 3. A shortened four-item scale was used at Time 4 for efficiency purposes. The five item scale and the four items used in the Time 4 scale were correlated for subordinates using Time 2 data and superiors using Time 3 data. The resulting correlations were .92 and .90, respectively. As such, we believed the shortened version of the contingent punishment scale was representative of the longer version and, therefore, the two were treated as comparable. A typical item was "He shows displeasure when a follower's work is below acceptable levels." A cadet received a contingent punishment score based on the average of these five (or four) items. If a focal cadet was rated by more than one evaluator within a rater group (e.g., more than one superior or subordinate) the scale scores were averaged across raters.

Noncontingent Punishment. Items measuring noncontingent punishment were chosen from Podsakoff, Todor, and Skov (1982). Four items assessed noncontingent punishment at each time period. A typical item was "He shows displeasure with his followers for no apparent reason." A cadet received a noncontingent punishment score based on the average of these four items. If a focal cadet was rated by more than one evaluator within a rater group (e.g., more than one superior or subordinate) the scale scores were averaged across raters.

Laissez-faire Leadership. Items measuring laissez-faire leadership were taken from the MLQ. At Times 2 and 3, the laissez-faire scale included eight items. At Time 4, the scale was reduced to four items. A typical item was "He takes no action even when problems become chronic." A cadet received a laissez-faire score based on the average of these eight or four items. If a focal cadet was rated by more than one evaluator within a rater group (e.g., more than one superior or subordinate) the scale scores were averaged across raters.

To assess the comparability of the 8- and 4-item scales, a correlation was computed between the 8 items (mean=1.53; s.d.=.59) as rated by subordinates at Time 2 and the 4 items (mean=1.45; s.d.=.62) used in the Time 4 version as rated by subordinates at Time 2. The resulting correlation was .91. A similar correlation was computed for superior ratings at Time 2 using the eight items (mean=1.65; s.d.=.74) and superior ratings at Time 4 using the four items (mean=1.70; s.d.=.93). This correlation also was .91. As such, we believed the shortened version of the laissez-faire scale was representative of the longer version and therefore the two were treated as comparable.

Administration of Leadership Surveys

Leadership measures were collected on focal cadets when they were sophomores and juniors in group testing sessions, with coordination and supervision provided by a principal investigator and several research assistants. Attendance at these sessions was mandatory, however, exceptions were granted for those cadets who had particular conflicts (e.g., an athletic competition). Cadets excused from these initial data collection sessions received the appropriate surveys by mail for completion and return.

Surveys completed by subordinates, superiors and peers contained names of specified focal cadets (ratees). Raters were instructed to evaluate only the focal cadets listed on their surveys. Each rater was asked to rate three focal cadets. If the focal cadet could not rate a named focal cadet because he did not know the cadet well enough, he was provided with another name. As a last alternative, the cadet was allowed to select a cadet he was familiar with to rate. In most cases, cadets rated named focal cadets.

The surveys containing measures of transformational leadership and laissez-faire leadership were administered at separate times from those measuring contingent reward and contingent and noncontingent punishment in all administrations but the one done in the focal cadet's senior year (Time 4). At this time, the time constraints imposed by VMI required us to collect all leadership data together.

Table 2 contains the number of surveys received from each rater group, and the average number of surveys received for each focal cadet rated. As can be seen from this table, not all focal cadets were rated on each survey by each rater group. Numerous attempts were made to obtain surveys from those unable to attend the sessions, but these attempts were not always successful, resulting in the differences in numbers of ratings per focal cadet.

Table 2

Average Number of Leadership Surveys Received From Each Rater Group and Average and Maximum Number of Leadership Surveys Received for Each Focal Cadet

	Total Number of Surveys Completed	Average Number of Surveys Received for Each Focal Cadet	Maximum Number of Surveys Received for a Focal Cadet
<u>Time 2</u>			
Subordinates ^a	660	2.92	10
Superiors ^b	315	1.74	6
<u>Time 3</u>			
Subordinates ^c	242	1.57	6
Superiors ^d	264	1.69	7
<u>Time 4</u>			
Subordinates ^e	303	2.30	14
Peers ^f	85	1.15	3

^aFreshmen rating sophomore focal leaders

^bJuniors and seniors rating sophomore focal leaders

^cSophomores rating junior focal leaders

^dSeniors rating junior focal leaders

^eSophomores and juniors rating senior focal leaders

^fSenior focal leaders rating each other

Leadership Effectiveness Measures

Two independent measures of leader effectiveness were obtained. The first was a measure of leadership responsibilities assumed by focal cadets. This was operationalized as the level of rank attained in the military hierarchy at VMI during the cadet's senior year. The highest rank is Regimental Commander (held by 1 cadet), followed in order by Regimental Executive Officer (held by 1 cadet); Battalion Commanders (held by 3 cadets); Regimental Staff Officers (held by 6 cadets); Battalion Executive Officers (held by 3 cadets); Company Commanders (held by 10 cadets); Battalion Staff Officers and Company Executive Officers (held by 28 cadets); and Platoon Leaders (held by 30 cadets). A total of 82 cadet officer positions were filled in the senior year.¹ Not all cadets hold a formal leadership position in their senior year. Ranks were assigned scores from zero to six, increasing in value as they increase up the military hierarchy. For example, platoon leaders were assigned a score of one, company executive officers a score of two and so on. Six was the highest rank attained by any cadet. A cadet who held no leadership rank in his senior year received a score of zero for this measure.

The second measure of leader effectiveness (collected subsequent to the collection of all leadership ratings) was a measure of peer rankings of leader effectiveness, obtained at the end of the fourth year from the focal cadets' peers. Many studies have shown very high validity for peer rankings or peer nominations and objective performance measures (Downey, Medland, & Yates, 1976; Hollander, 1965; Kraut, 1975; Mumford, 1983). Each cadet was ranked by each of the other 25-28 cadets in his senior class and company. Cadets selected the top five most effective leaders among their peers, and the bottom five least effective leaders among their peers from a list of names of the seniors in their company. If a rater did not rank a cadet in the top five or bottom five, a score was assigned which represented the midpoint score in that company. Based on the number of times

¹The cadet officer selection process is initiated with a compilation of individual performance scores of all cadets who wish to be considered for a cadet officer position. Members of VMI faculty, staff, athletic, and ROTC departments complete performance evaluations for the individuals eligible to receive cadet rank appointments (Cadets cannot be on academic or conduct probation). The cadet candidates complete applications and submit them to the cadet officer selection board if they are interested in holding rank. Those cadets who receive the highest performance scores are then interviewed by the board which consists of faculty and officer representatives, as well as current cadet officers. Based on the interviews, cadets are appointed into the rank positions by the board.

a cadet was ranked first, second, third, twenty-fifth, twenty-sixth, etc., or not ranked, a score was computed for each cadet. This scoring procedure is described in detail in Appendix A.

For purposes of using these two measures of effectiveness as independent variables in a series of analyses of variance, each of the above measures also was converted into grouped cumulative scores. Grouped senior rank was created by first obtaining the mean and standard deviation of the senior rank variable. If the cadet's senior rank was more than one-half a standard deviation above the mean, the cadet received a two on grouped senior rank. If the cadet's senior rank score was between one-half a standard deviation above or below the mean, the cadet received a score of one. If the cadet held no rank during his senior year he received a score of zero. As it turned out, cadets receiving senior rank scores of three or more (Battalion Executive Officers to Regimental Commander) received a two. Those receiving scores of one or two (Platoon Leaders to Company Executive Officers) received a one, and those who had held no rank senior year received a zero.

Grouped peer ranking was created in a similar way. A cadet was assigned a score of zero, one, or two on the basis of the peer ranking score the cadet received in his senior year. If the cadet's peer ranking score was more than one half a standard deviation above the mean peer ranking, the cadet received a score of two. If his score was between one half a standard deviation above or below the mean peer ranking score, he received a one, and if the score was one half a standard deviation or more below the mean, he received a zero on this measure. The correlation between grouped senior rank and grouped peer rank was .43 ($p < .001$).

A frequency distribution for cadets classified into each of the senior rank groups, and each of the peer ranking groups is presented in Table 3. Fifty-six cadets were in both the low peer ranking group and the low senior rank group, 26 cadets were in the middle group on both variables, and 18 cadets were in the high group on both variables.

RESULTS

Sample Size Fluctuations

A number of factors have contributed to a less than pure longitudinal study across the four years. That is, even though we began with a sample size of over 400 in Year 1 and attempted to collect data at all time periods on each cadet, our sample over the course of the four years dwindled. First, over the four-year period, 165 cadets attrited from VMI or for some other

Table 3

Frequency of Cadets in Senior Rank and Peer Ranking Groups

<u>Senior Rank</u>		<u>Grouped Senior Rank</u>		<u>Grouped Peer Ranking</u>	
<u>Score</u>	<u>Frequency</u>	<u>Score</u>	<u>Frequency</u>	<u>Score</u>	<u>Frequency*</u>
0 No Rank	156	0=Low (No Rank)	156	0=Low	63
1 Platoon Leaders	28	1-Middle (Plat Ldr to Co. Exec. Officer)	56	1=Middle 2=High	86 65
2 Bat. Staff/Co. Exec.	28				
3 Bat. Exec./Co. Cdr.	13				
4 Reg. Staff	6	2=High (Bat Exec. to Reg Cdr)	24		
5 Bat. Cdr/Reg. Exec.	4				
6 Reg. Cdr	2				

Note: n=236

*Twenty-two cadets out of 236 (9%) had missing data on this measure.

reason (e.g. medical) were no longer among the original class. Second, we had missing data on some cadets (usually less than 25%) on some measures. As such, the number of cadets for whom we had complete measures over the four-years was too small to reliably test. As such, we made comparisons over time for those cadets who remained at VMI throughout the four years and who had data at each time period. For instance when we looked at self-esteem at Time 1, those cadets who were still class members and who provided self-esteem data at Time 1 were included. Consequently, the n's for the various comparisons were not constant over time.

Nonetheless, we were still able to look at changes among the samples over time, though we could not test the entire cohort over time. Our analyses generally reflect an attempt to glean as much meaning from the data as possible without using unreliable small samples.

Individual Differences Linked to Leader Effectiveness

Four individual difference variables were measured at varying intervals over time. Physical fitness, self-esteem, and hardiness were assessed four times over the four-year period. Moral reasoning was assessed three times. Table 4 presents a timeline indicating when each of the measures was obtained over the four-year period. Our first research question concerned the extent to which these individual difference variables, measured over time, could distinguish the most versus least effective leaders in Year 4.

We attempted to run multivariate analyses of variance (MANOVA) using the individual difference variables and the two effectiveness criteria to assess the overall relationship between individual differences and effectiveness. However, because MANOVA can be performed only with listwise deletion, any cadet who did not have complete data for all predictors and criteria was dropped from this analysis. This reduced the sample size to the point the analyses would have been unreliable. Thus, only univariate analyses were performed.

A comparison was made of each of the four individual difference variables, over time, for the leaders considered in the top, middle and low peer ranking and senior rank groups. As can be seen from Table 5, at Time 1 physical fitness levels among cadets differed significantly as a function of senior rank, and self-esteem was marginally significant. The means indicate that, consistent with our expectations, physical fitness and self-esteem were highest for those in the high rank group. At Times 2, 3 and 4, again, cadets in the three senior rank groups differed significantly on physical fitness, self-esteem, and

Table 4

Timeline of Predictor and Leadership Measures Collected Over Four Years

<u>Time 1</u> AY 1991-92	<u>Time 2</u> AY 1992-93	<u>Time 3</u> AY 1993-94	<u>Time 4</u> AY 1994-95
Self-Esteem	Self-Esteem	Self-Esteem	Self-Esteem
Hardiness	Hardiness	Hardiness	Hardiness
Physical Fitness	Physical Fitness	Physical Fitness	Physical Fitness
Moral Reasoning	Subordinate (freshmen) Ratings of TF/LF/CR/CP/NCP	Moral Reasoning	Moral Reasoning
Cognitive Ability		Subordinate (sophomore) Ratings of TF/LF/CR/CP/NCP	Subordinate (sophomores and juniors) Ratings of TF/LF/CR/CP/ CP/NCP
Conscientiousness		Superior (juniors and seniors) Ratings of TF/LF	Peer Ratings of TF/LF/CR/CP/NCP
Leader Potential Index			Rank Attained
Prior Influence			
BIOLEAD			Peer Rankings of Effectiveness

NOTE: AY = Academic Year; TF = Transformational Leadership; LF = Laissez-faire;
 CR = Contingent Reward; CP = Contingent Punishment; NCP = Noncontingent Punishment

Table 5

A Mean Comparison of Cadets in Three Senior Rank Groups on Four Predictors Collected at Four Different Times

<u>Time 1</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Physical Fitness	184.64 (137)	191.63 (50)	207.21 (20)	5.08**
Self-Esteem	3.33 (152)	3.35 (53)	3.51 (23)	2.49*
Hardiness	7.06 (146)	7.11 (56)	7.47 (23)	1.10
Moral Reasoning	29.15 (139)	28.05 (54)	28.42 (20)	.20
<u>Time 2^b</u>				
Physical Fitness	204.11 (143)	210.63 (52)	224.92 (22)	4.95**
Self-Esteem	3.25 (116)	3.34 (42)	3.61 (20)	5.50**
Hardiness	6.93 (114)	7.39 (42)	7.51 (20)	4.88**
<u>Time 3</u>				
Physical Fitness	207.14 (142)	216.93 (53)	242.93 (21)	10.81***
Self-Esteem	3.23 (111)	3.27 (47)	3.65 (20)	6.98**
Hardiness	7.24 (112)	7.28 (47)	7.81 (20)	3.11*
Moral Reasoning	32.32 (95)	35.71 (38)	30.99 (17)	1.57

Table 5 (continued)

<u>Time 4</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Physical Fitness	205.39 (121)	217.34 (45)	253.84 (20)	15.51***
Self-Esteem	3.17 (79)	3.35 (38)	3.62 (13)	3.83*
Hardiness	6.81 (79)	7.30 (38)	7.71 (13)	4.40**
Moral Reasoning	31.09 (43)	37.11 (15)	34.20 (10)	1.80

NOTE: Specific samples sizes for each comparison are in parentheses.

* $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

hardiness with the cadets in the high rank group scoring higher on all three measures.

Table 6 presents the comparable univariate analyses for physical fitness, self-esteem, hardiness, and moral reasoning at the four time periods for the peer ranking groups. At Time 1, physical fitness scores were highest for those cadets in the high peer ranking group and moral reasoning scores were lowest for those in the middle group. At Time 2, cadets with higher physical fitness scores and higher hardiness scores were more likely to be in the high peer ranking groups. At Time 3, again physical fitness was higher among those cadets with higher peer rankings, but moral reasoning also distinguished the groups (a marginally significant effect). In this case, however, those in the highest peer ranking groups did not have the highest moral reasoning scores. Rather, those in the lowest peer ranking group had the highest moral reasoning scores. Surprisingly, at Time 4, when measures were taken shortly before the peer rankings were obtained, only the physical fitness scores were significantly different among the three peer ranking groups.

For ease of interpretation, Figures 1-8 present the means, plotted over time, on each of the four predictor variables for the two leader effectiveness criteria. Dependent t-tests were conducted on the individual difference variables at each level within each group to assess the significance of the increases or decreases in scores over time. Specific t-test values, and sample sizes are reported in Appendix B. Tables 5 and 6 present the corresponding means, sample sizes and univariate results (from which the figures were generated) for each of the predictor variables with leader effectiveness criteria. Note that the scores in the tables are rounded to one decimal place while the figures were plotted using scores rounded to two decimal places.

Figure 1 presents the physical fitness data over time for those in the high, middle and low senior rank groups. As can be seen from the figure, the pattern of results, generally increasing fitness over time, is similar for the three groups. Fitness levels increased significantly from Time 1 to Time 4 for all senior rank groups. However, those with the highest rank consistently had significantly higher physical fitness scores than those holding no rank (see Tables 5 and 6). A similar pattern is presented in Figure 2 for those in the high, middle and low peer ranking groups. Again, the fitness levels increased significantly from Time 1 to Time 4 for all groups.

Figure 3 presents the results of the self-esteem scores over time for those in the high, middle, and low senior rank groups. Interestingly, similar to the physical fitness data, those with the highest rank were consistently the highest on self-esteem across the three time periods. Senior rank groups differed significantly on self-esteem at each time (see Table 5). Those

Table 6

**A Mean Comparison of Cadets in Three Peer Ranking Groups
on Four Predictors at Four Different Times**

<u>Time 1</u>	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>F</u>
Physical Fitness	176.27 (54)	189.42 (76)	197.31 (58)	6.63**
Self-Esteem	3.27 (63)	3.33 (81)	3.41 (63)	2.29*
Hardiness	6.29 (63)	7.07 (83)	7.23 (61)	.97
Moral Reasoning	31.64 (55)	25.83 (81)	29.00 (57)	4.52*
<u>Time 2</u>				
Physical Fitness	195.75 (56)	209.01 (80)	214.19 (61)	6.31**
Self-Esteem	3.26 (47)	3.25 (64)	3.30 (55)	1.70
Hardiness	7.15 (46)	6.86 (63)	7.34 (55)	2.78*
<u>Time 3</u>				
Physical Fitness	196.78 (57)	213.54 (79)	224.13 (60)	9.89***
Self-Esteem	3.30 (46)	3.20 (69)	3.35 (50)	1.40
Hardiness	7.22 (46)	7.25 (70)	7.40 (50)	.49
Moral Reasoning	36.35 (41)	31.69 (53)	31.98 (44)	2.42*

Table 6 (continued)

<u>Time 4</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Physical Fitness	202.20 (50)	213.91 (69)	224.14 (61)	4.49*
Self-Esteem	3.27 (39)	3.21 (54)	3.35 (35)	.56
Hardiness	7.04 (39)	6.94 (54)	7.25 (35)	.71
Moral Reasoning	33.25 (18)	34.15 (22)	31.86 (24)	.23

NOTE: Specific sample sizes for each comparison are in parentheses.

- * p < .10
- * p < .05
- ** p < .01
- *** p < .001

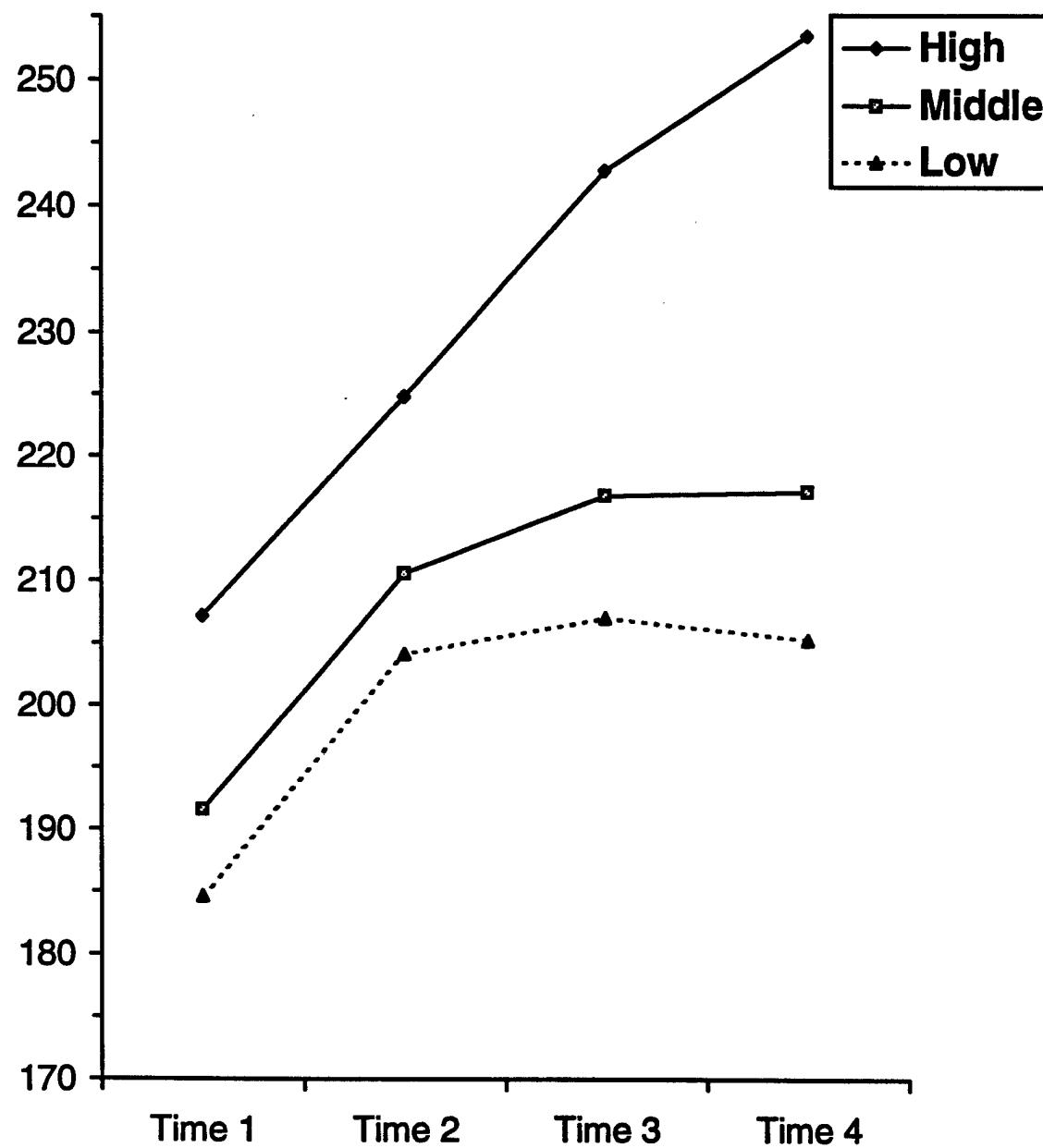


Figure 1 Physical Fitness Scores for Cadets in High, Middle and Low Senior Rank Groups Over Time

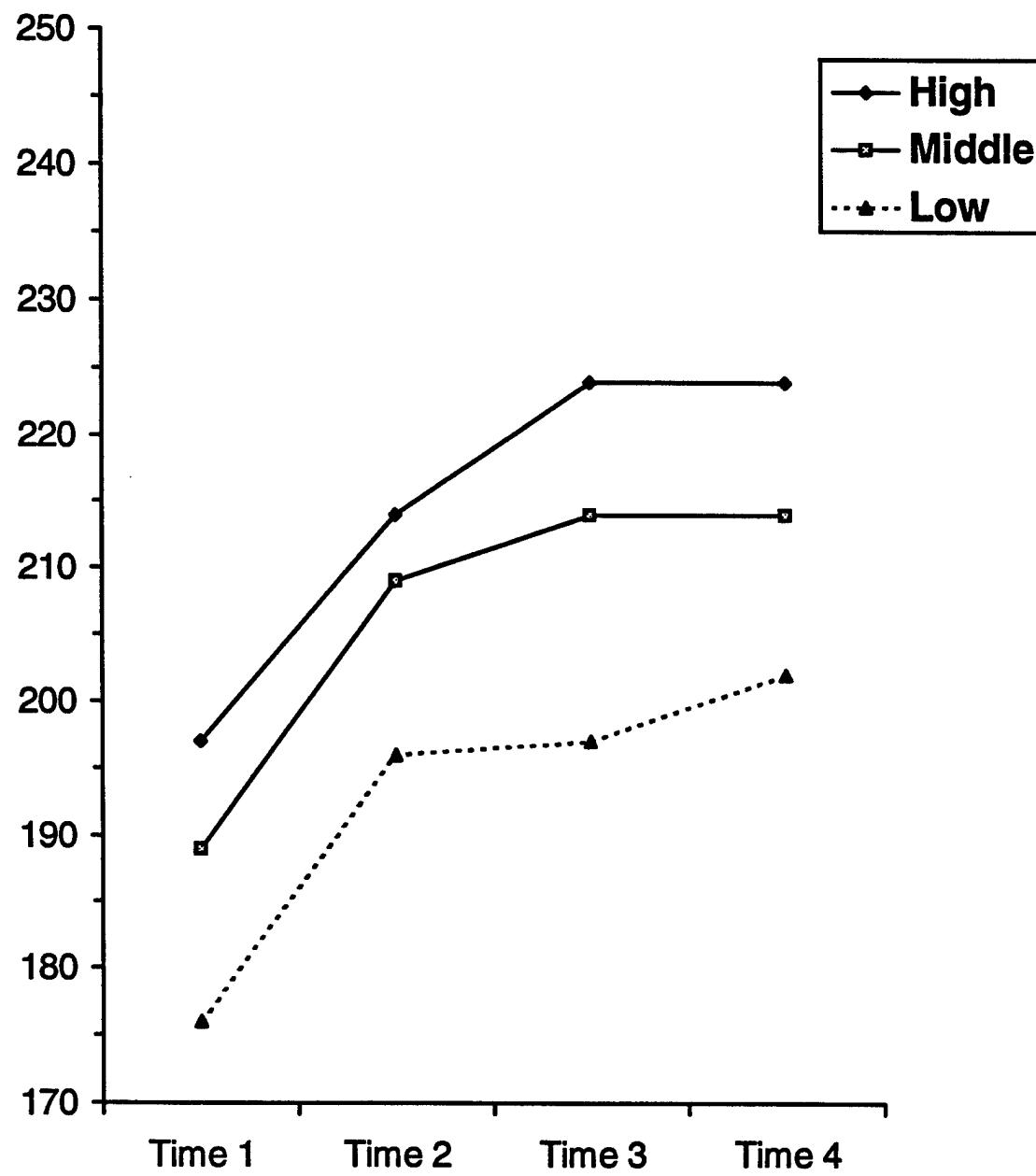


Figure 2 Physical Fitness Scores for Cadets in High, Middle and Low Peer Ranking Groups Over Time

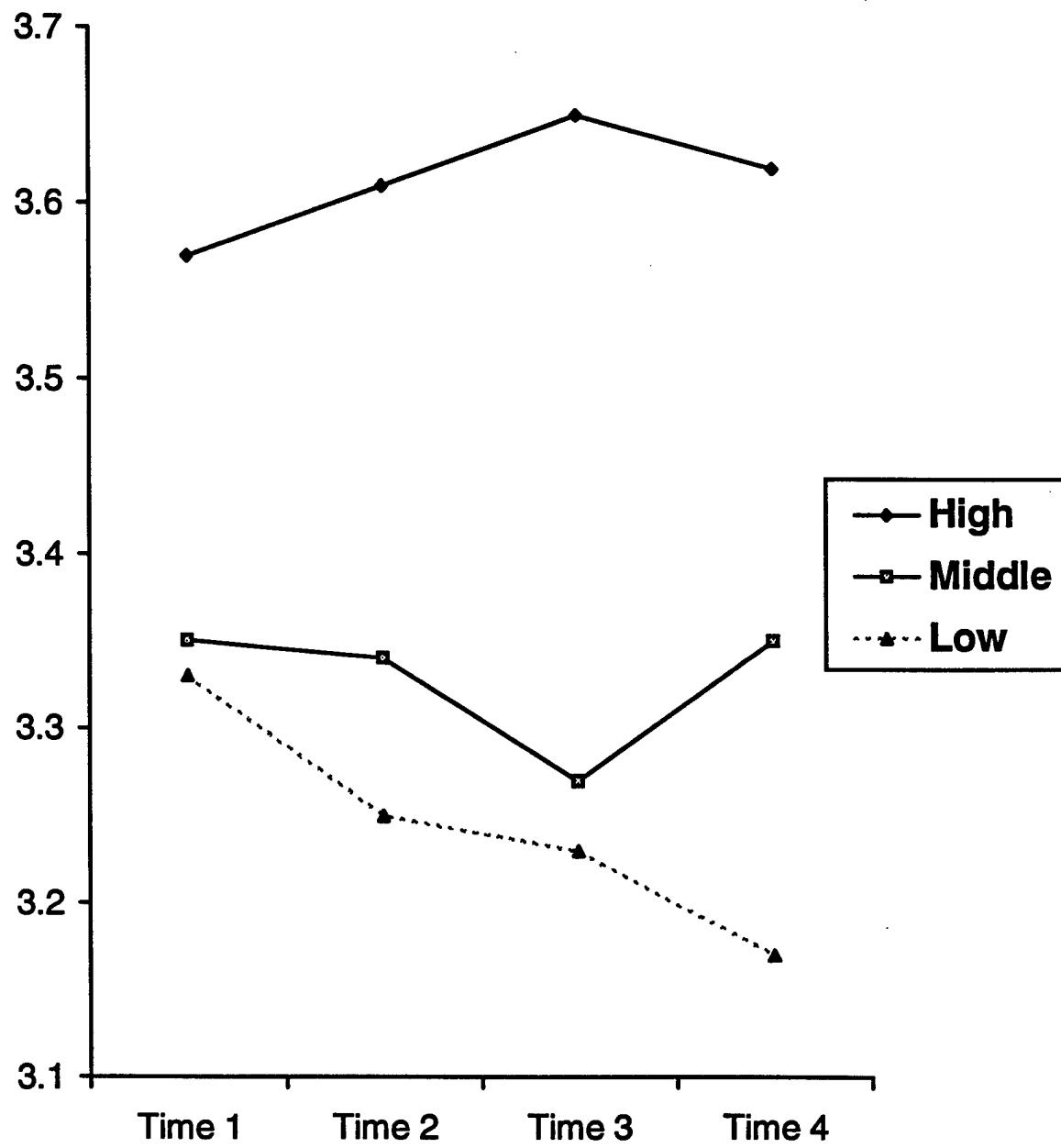


Figure 3 Self-Esteem Scores for Cadets in High, Middle and Low Senior Rank Groups Over Time

with no rank were the lowest on self-esteem at each time period. It is interesting to note the drop in self-esteem among those cadets who held no senior rank.

Figure 4 presents the self-esteem data for those in the high, middle and low peer ranking groups. While the highest ranking group is higher on self-esteem throughout the four years, the differences are not as dramatic as for the senior rank criterion and only differ significantly among the peer ranking groups at Time 1 (see Table 6). It is interesting to note that the self-esteem scores dropped off for all three groups at Time 4 to below the scores at matriculation, although no group experienced a significant drop. Somewhat surprisingly and contrary to our expectations none of the groups increased significantly on self-esteem from matriculation to graduation when either the senior rank or peer ranking criterion is considered.

Figure 5 presents the pattern of hardness scores over time for those in the high, middle and low senior rank groups. Those who had attained high rank scored significantly higher than the low group at Times 2, 3 and 4 (see Table 5). Those who did not hold rank had a significant drop in hardness from Time 2 to Time 3 and then from Time 3 to Time 4. This was not the case for those cadets who held rank.

Figure 6 presents the results for hardness as a function of peer ranking groups. The patterns for the three groups are similar, with those receiving the highest peer rankings also displaying the highest hardness, though the differences are not remarkable between groups. The peer ranking groups only differed significantly at Time 2 (see Table 6). Here again, the drops in hardness from Time 1 to Time 4 are notable though the decreases are not statistically significant.

Figure 7 presents the senior rank data for moral reasoning scores over the three time periods. Interestingly, moral reasoning scores generally go up, with significant increases between Times 1 and 3 for the low and middle rank groups and marginally significant increases between Times 1 and 4 for these same two groups. For those who did not hold rank, their scores were higher than those holding rank at Time 1, but dropped off some at Time 4. Sample sizes in these groups were quite small in some cases, so these data should be interpreted cautiously. The comparisons for moral reasoning over time by peer ranking group (presented in Figure 8) are similar to those for cumulative rank groups, though the low peer ranking group did not increase significantly in moral reasoning from Time 1 to Time 3. However, all groups for both effectiveness criteria displayed increases from Time 1 to Time 4, although the increases were only marginally significant.

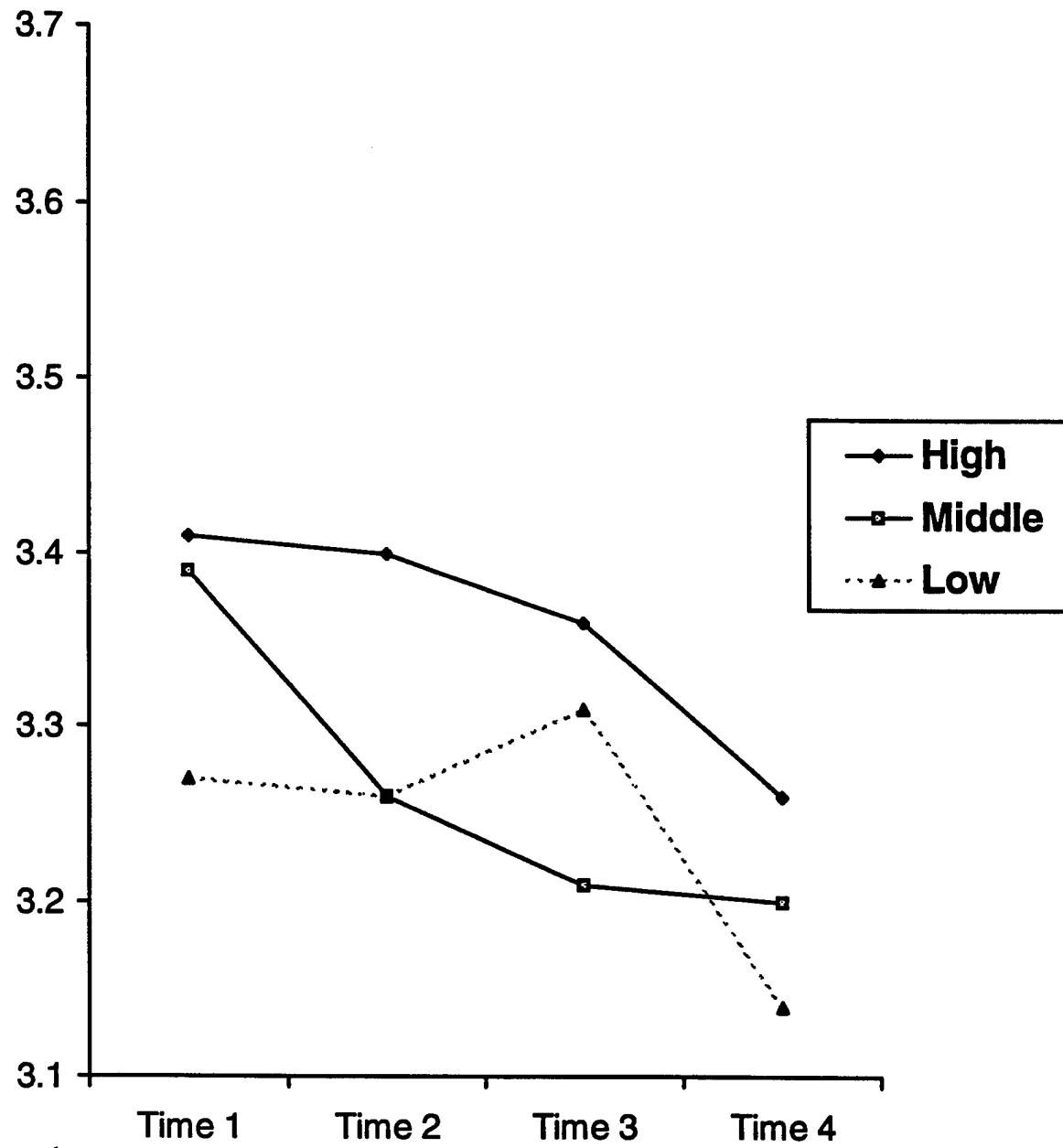


Figure 4 Self-Esteem Scores for Cadets in High, Middle and Low Peer Ranking Groups Over Time

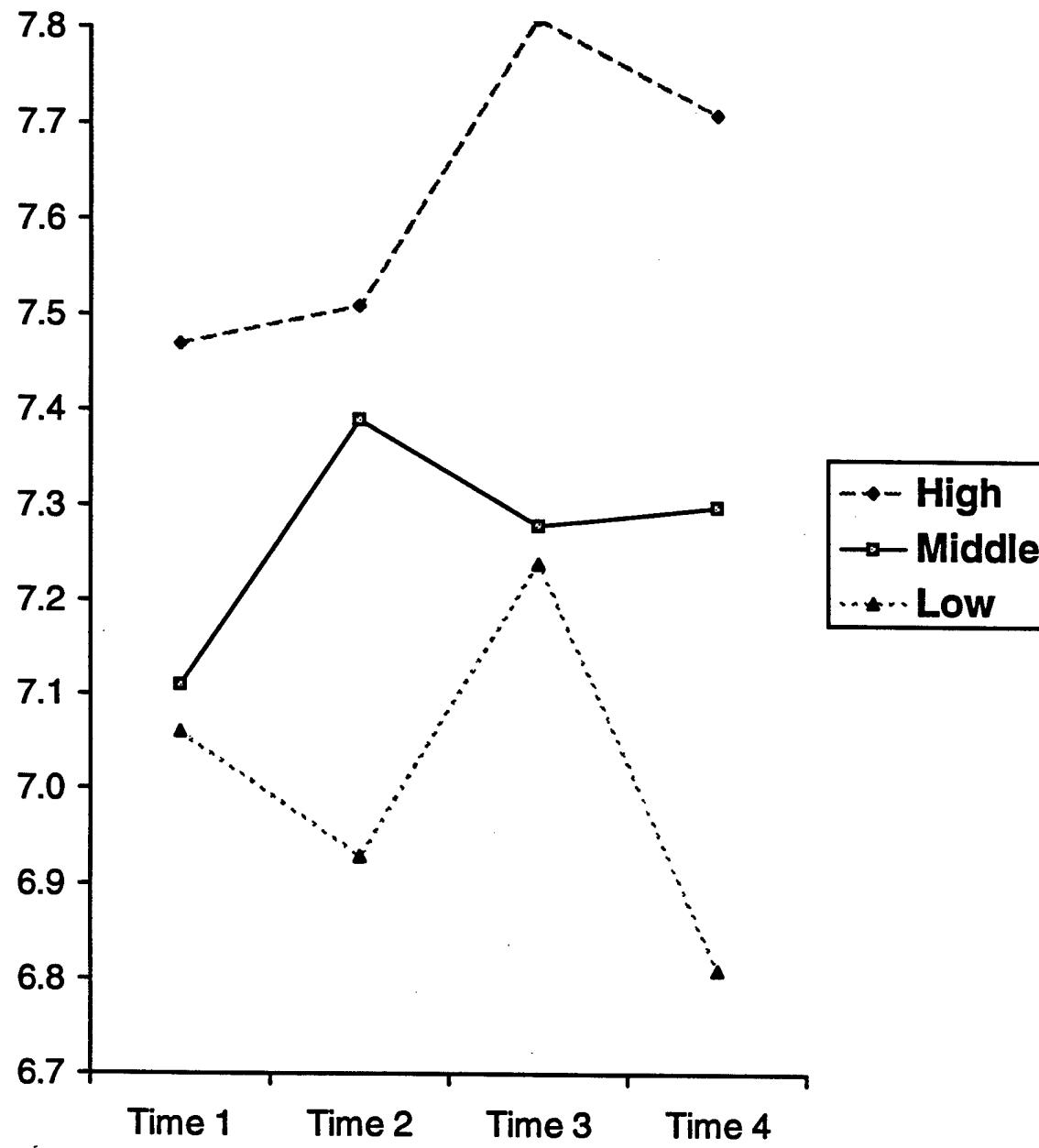


Figure 5 Hardiness Scores for Cadets in High, Middle and Low Senior Rank Groups Over Time

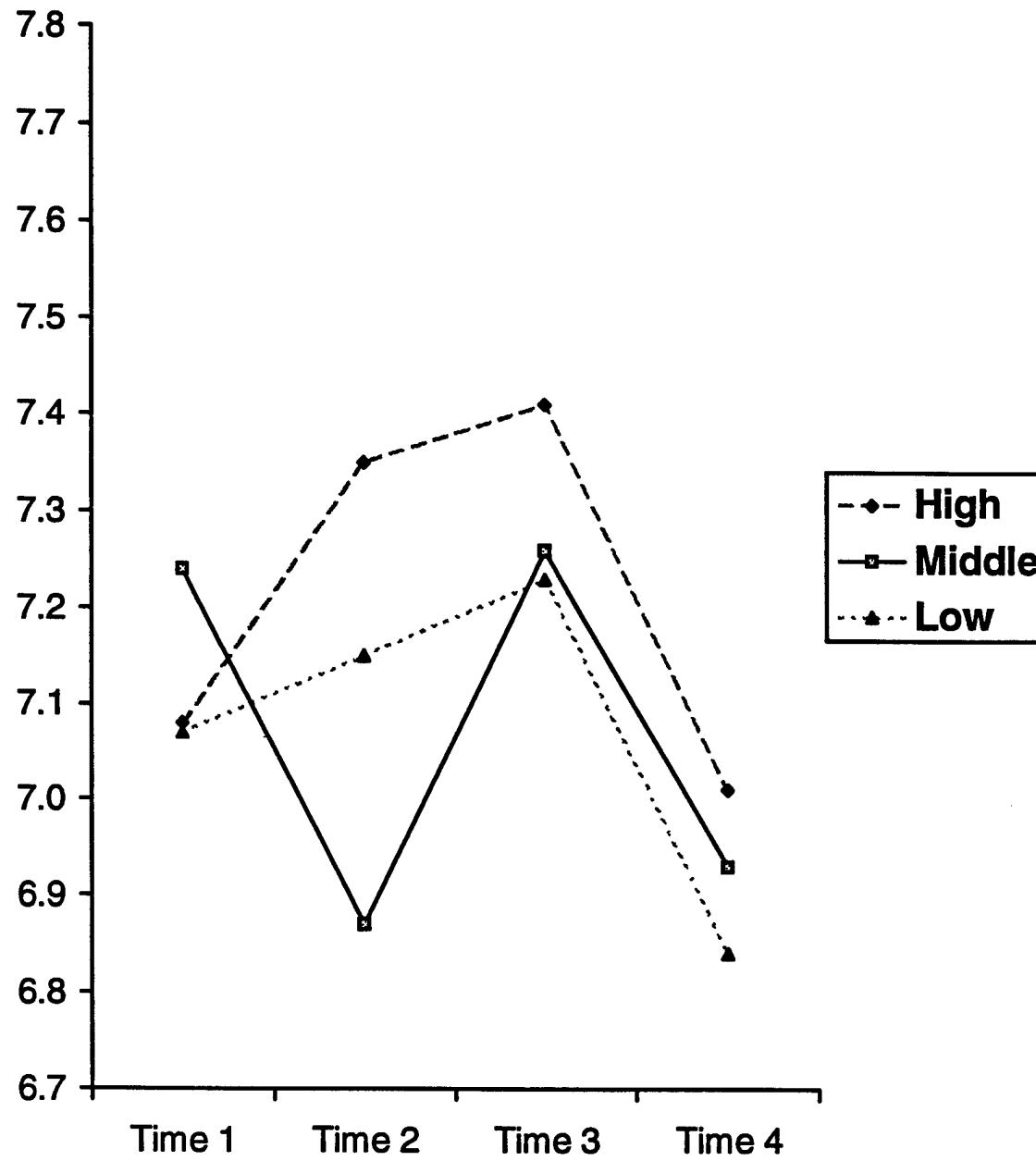


Figure 6 Hardiness Scores for Cadets in High, Middle and Low Peer Ranking Groups Over Time

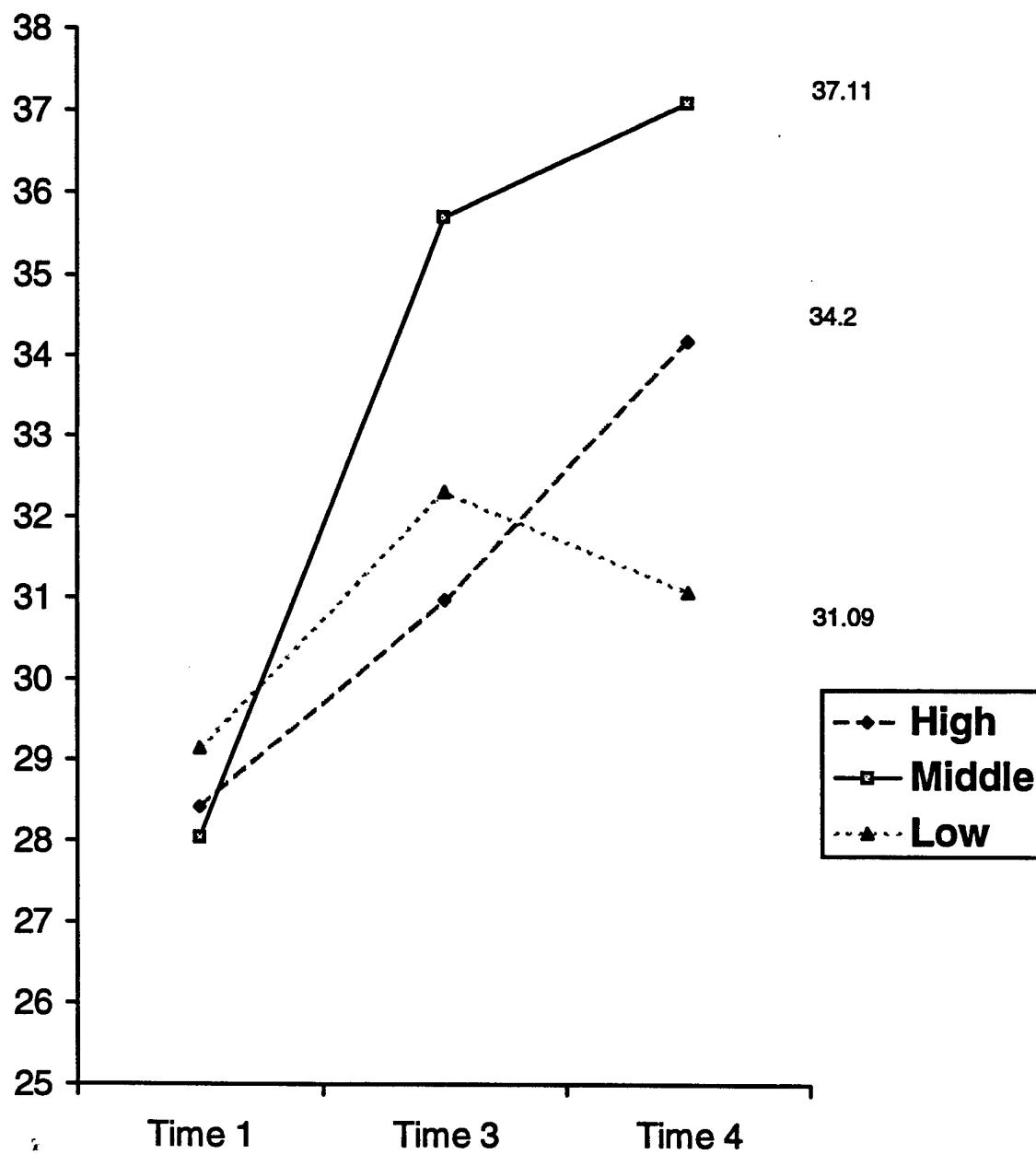


Figure 7 Moral Reasoning Scores for Cadets in High, Middle and Low Senior Rank Groups Over Time

Note: Moral Reasoning data were not collected at Time 2.

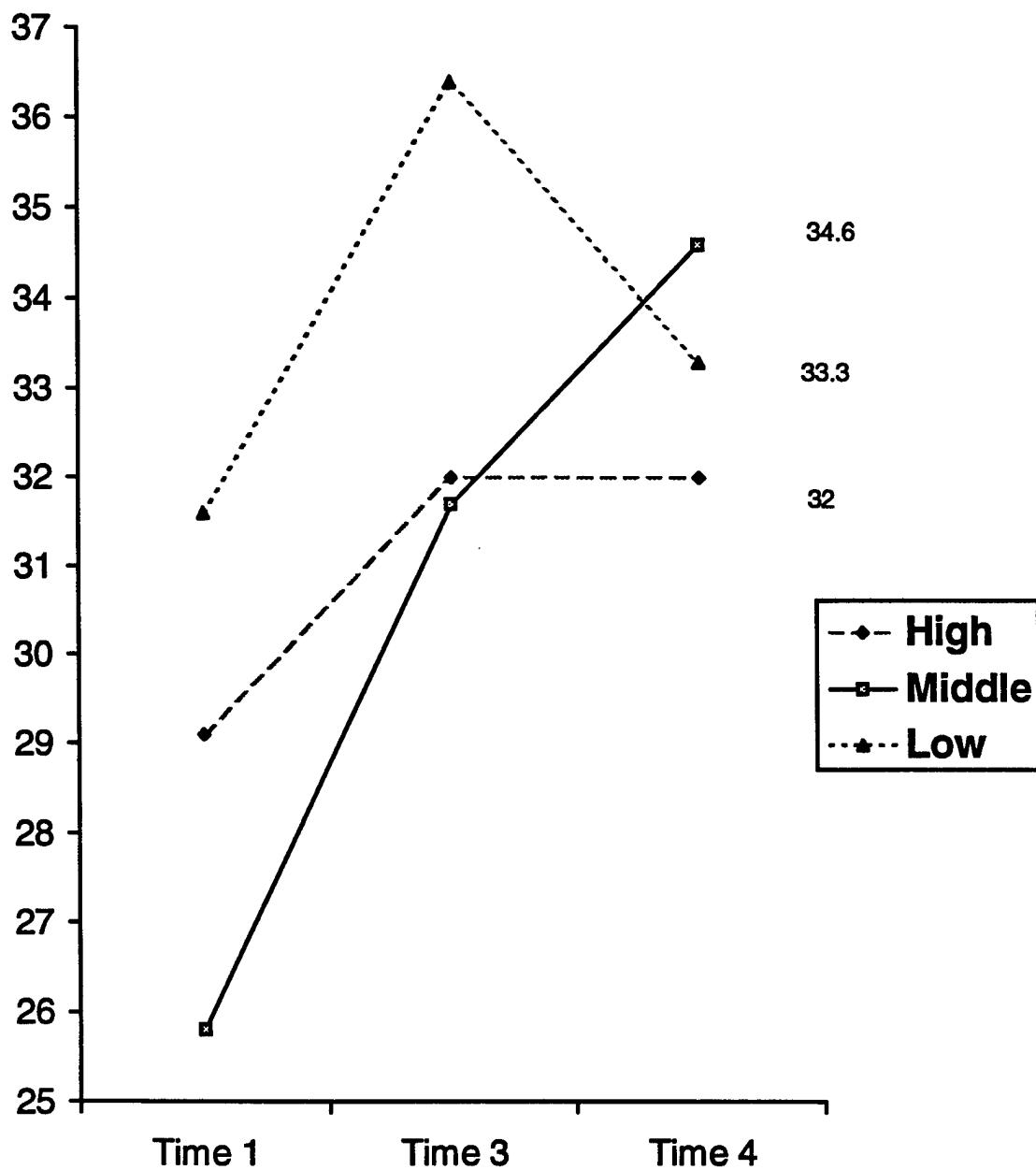


Figure 8 Moral Reasoning Scores for Cadets in High, Middle and Low Peer Ranking Groups Over Time

Note: Moral Reasoning data were not collected at Time 2.

When these four predictor variables were included in multiple regression analyses, predicting each of the criterion variables, the multiple R was significant in each equation (see Table 7). Physical fitness was clearly the best predictor for each of the four time periods for both measures of effectiveness. The beta for physical fitness predicting senior rank was significant at each of the three time periods.² The beta for physical fitness predicting peer rankings was significant at three of the four time periods. Self-esteem also emerged as a significant unique predictor of senior rank at Times 2 and 3, and hardiness at Time 2 was marginally predictive of senior rank. If we look at the correlations presented in Table 7, hardiness at Time 3 is positively related to senior rank, though the correlation is modest and the beta is nonsignificant.

An additional set of analyses was performed to assess the extent to which a more complete set of individual difference variables measured at Time 1 could account for a significant portion of variance in each of the effectiveness measures.

Table 8 presents the results of the regression analysis using cognitive ability, hardiness, BIOLEAD, physical fitness, prior influence experiences, conscientiousness, moral reasoning, self-esteem and the leader potential index as predictors of (ungrouped) senior rank and peer rankings. The regression equation predicting senior rank (presented in Table 8) was significant ($R^2 = .11, p < .001$). Cognitive ability, physical fitness, and prior influence experiences, were significant predictors, accounting for unique variance (i.e., significant betas) in senior rank held. Moral reasoning was marginally significant. Higher cognitive ability, better physical fitness, more prior influence, and lower moral reasoning characterized those who had attained higher rank.

Table 8 also presents the analyses using the same set of predictors described above to predict peer ranking scores. In this analysis, the equation also was significant ($R^2 = .10, p < .01$). The significant predictors of unique variance were physical fitness and prior influence.

Leader Behaviors Linked to Leader Effectiveness

Five leadership variables were measured at varying intervals over time. Both superior and subordinate perceptions of

²Senior rank was not used as a criterion at Time 4 because ranks were decided before Time 4 predictors were measured.

Table 7

Regression Analyses: Physical Fitness, Self-Esteem, Hardiness
and Moral Reasoning (Times 1, 2, 3, 4) Predicting Senior Rank
and Peer Rankings

	Senior Rank		Peer Rankings	
	\bar{x}	β	\bar{x}	β
<u>Time 1</u>				
Physical Fitness	.20**	.16*	.23**	.19**
Self-Esteem	.14*	.12*	.12	.10
Hardiness	.05	.01	.01	-.03
Moral Reasoning	-.04	-.06	-.06	-.07
	Multiple R = .22*		Multiple R = .23*	
	$R^2 = .05**$		$R^2 = .05*$	
<u>Time 2</u>				
Physical Fitness	.22**	.19***	.23***	.19**
Self-Esteem	.22**	.15*	.10	.06
Hardiness	.22**	.13*	.11	.05
	Multiple R = .31***		Multiple R = .22**	
	$R^2 = .09***$		$R^2 = .05$	
<u>Time 3</u>				
Physical Fitness	.28***	.26***	.31***	.28***
Self-Esteem	.23**	.16*	.02	-.04
Hardiness	.15*	.02	.05	.04
Moral Reasoning	.00	-.01	-.12	-.08
	Multiple R = .33***		Multiple R = .30***	
	$R^2 = .11***$		$R^2 = .09***$	
<u>Time 4</u>				
Physical Fitness			.22**	.18
Self-Esteem			.08	.02
Hardiness			.09	.04
Moral Reasoning			-.02	-.02
	Multiple R = .20*			
	$R^2 = .04*$			

* $p < .10$
 * $p < .05$
 ** $p < .01$
 *** $p < .001$

Note: Time 4 measures were not used as predictors of senior rank because they were collected after senior ranks were assigned.

Table 8

Individual Differences as Predictors of Senior Rank and Peer Rankings

	Senior Rank		Peer Rankings	
	r	β	r	β
Cognitive Ability	.15*	.18**	-.04	-.01
Hardiness (Time 1)	.05	-.01	.01	-.04
BIOLEAD	.14*	.09	.10	.07
Physical Fitness (Time 1)	.20**	.14*	.23**	.18**
Prior Influence Experiences	.18**	.15*	.24**	.21**
Conscientiousness	.12*	.05	.07	.06
Moral Reasoning (Time 1)	-.04	-.11*	-.06	-.07
Self-Esteem (Time 1)	.14*	.08	.12*	-.06
Leader Potential Index (LPI)	.15*	-.01	.07	-.07
Multiple R = .33**		Multiple R = .32**		
$R^2 = .11**$		$R^2 = .10**$		

* $p < .10$
 ** $p < .05$
 *** $p < .01$
 **** $p < .001$

transformational, laissez-faire, contingent reward, contingent punishment, and noncontingent punishment were obtained.³ During the focal cadets' senior year, peer ratings of leader behavior were collected in lieu of superior ratings. For illustrative purposes, Figures 9-18 present the patterns of leadership behaviors exhibited by the focal cadets in the low, middle and high senior rank and peer ranking groups as rated by superiors and subordinates on the five leadership measures. Tables 9-14 present the corresponding means, sample sizes and univariate results (from which the figures were generated) for each of the leadership behaviors with leader effectiveness criteria. Appendix B presents the significant t-test results of leader behaviors compared over time. For the reader's information, Table 15 also includes the correlations between the leadership variables at each time period and the two effectiveness measures.

As can be seen from Table 9, subordinate ratings of laissez-faire behaviors and superior ratings of transformational leadership behaviors at Time 2 differed significantly across the senior rank groups. Those cadets who practiced less laissez-faire behavior with subordinates attained higher ranks. Those cadets whose superiors regarded as practicing more transformational behavior attained higher ranks.

Table 10 presents the corresponding time period results for peer rankings. Subordinate and superior ratings of laissez-faire behavior and superior ratings of transformational behavior differed significantly across peer ranking groups. Those cadets who practiced less laissez-faire behavior and more transformational behavior received higher peer rankings.

Table 11 presents results from Time 3 regarding senior rank and leader behaviors. Subordinate ratings of contingent reward, contingent punishment and noncontingent punishment behaviors differed significantly across senior rank groups. Those cadets who practiced more contingent reward and contingent punishment behaviors with less noncontingent punishment behavior attained higher ranks. Those with no rank received the highest laissez-faire scores from superiors.

Table 12 presents the corresponding time period results for peer rankings. These results are similar to the cumulative rank results in that subordinate ratings of contingent reward and contingent punishment differed significantly. Cadets who practiced more contingent reward and punishment and less laissez-faire behavior received higher peer rankings. Superiors'

³Superior ratings of contingent and noncontingent punishment and contingent reward were not collected at Time 2 due to scheduling conflicts.

Table 9

A Mean Comparison of Cadets in Three Senior Rank Groups on Leadership Measures at Time 2

Rater Group/Leader Behavior

<u>Subordinates</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Transformational	2.01 (105)	1.98 (44)	2.19 (19)	.70
Contingent Reward	1.86 (74)	1.98 (33)	2.08 (19)	.62
Contingent Punishment	1.86 (74)	1.92 (33)	2.05 (19)	.35
Noncontingent Punishment	1.64 (73)	1.71 (33)	1.77 (19)	.18
Laissez-faire	1.62 (101)	1.40 (44)	1.37 (19)	3.06*

Superiors

Transformational	2.04 (82)	2.30 (37)	2.54 (14)	3.62*
Laissez-faire	1.74 (86)	1.55 (37)	1.40 (14)	1.77

NOTE: Specific sample sizes for each comparison are in parentheses.

* p < .05

Table 10

A Mean Comparison of Cadets in Three Peer Ranking Groups on Leadership Measures at Time 2

Rater Group/Leader Behavior

<u>Subordinates</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Transformational	1.98 (42)	1.99 (56)	2.03 (53)	.08
Contingent Reward	1.78 (32)	1.89 (36)	2.04 (45)	.89
Contingent Punishment	1.83 (32)	1.71 (36)	2.00 (45)	1.17
Noncontingent Punishment	1.78 (32)	1.42 (35)	1.74 (45)	1.78
Laissez-faire	1.60 (41)	1.66 (54)	1.39 (52)	2.96*

Superiors

Transformational	1.82 (35)	2.26 (46)	2.35 (40)	5.60**
Laissez-faire	2.02 (34)	1.60 (49)	1.33 (41)	9.41**

NOTE: Specific sample sizes for each comparison are in parentheses

* $p < .10$

* $p < .05$

** $p < .01$

Table 11

A Mean Comparison of Cadets in Three Senior Rank Groups on Leadership Measures at Time 3

Rater Group/Leader Behavior

Subordinates	Low	Middle	High	F
Transformational	2.20 (80)	2.35 (37)	2.42 (17)	.84
Contingent Reward	1.90 (74)	2.37 (32)	2.45 (19)	5.21**
Contingent Punishment	1.84 (74)	2.02 (32)	2.41 (19)	4.63*
Noncontingent Punishment	1.73 (73)	1.34 (32)	.96 (19)	4.41*
Laissez-faire	1.62 (50)	1.45 (38)	1.37 (17)	1.01

Superiors

Transformational	2.17 (78)	2.29 (32)	2.20 (18)	.33
Contingent Reward	2.23 (95)	2.59 (41)	2.29 (19)	3.14*
Contingent Punishment	2.12 (97)	2.42 (41)	2.25 (19)	2.25†
Noncontingent Punishment	1.20 (94)	1.20 (41)	1.33 (19)	.22
Laissez-faire	1.77 (78)	1.30 (32)	1.36 (18)	4.58*

NOTE: Specific sample sizes for each comparison are in parentheses

† p < .10

* p < .05

** p < .01

Table 12

A Mean Comparison of Cadets in Three Peer Ranking Groups on Leadership Measures at Time 3

Rater Group/Leader Behavior

<u>Subordinates</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Transformational	2.08 (30)	2.14 (38)	2.39 (53)	1.91
Contingent Reward	1.76 (27)	2.21 (41)	2.28 (46)	3.19*
Contingent Punishment	1.67 (27)	1.90 (41)	2.23 (46)	5.11**
Noncontingent Punishment	1.82 (27)	1.42 (41)	1.33 (46)	1.82
Laissez-faire	1.60 (30)	1.87 (39)	1.33 (53)	4.83**

Superiors

Transformational	2.00 (35)	2.25 (44)	2.34 (38)	2.41*
Contingent Reward	2.18 (31)	2.28 (58)	2.49 (53)	1.60
Contingent Punishment	1.96 (32)	2.35 (59)	2.25 (53)	2.51*
Noncontingent Punishment	1.18 (31)	1.26 (58)	1.15 (52)	.24
Laissez-faire	2.00 (36)	1.55 (43)	1.25 (38)	8.53**

NOTE: Specific sample sizes for each comparison are in parentheses

* p < .10

* p < .05

** p < .01

Table 13

A Mean Comparison of Cadets in Three Senior Rank Groups on Leadership Measures at Time 4

Rater Group/Leader Behavior

<u>Subordinates</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Transformational	2.47 (63)	2.62 (40)	2.60 (21)	.43
Contingent Reward	2.56 (63)	2.67 (40)	2.52 (21)	.20
Contingent Punishment	2.13 (63)	2.41 (40)	2.30 (21)	1.92
Noncontingent Punishment	1.65 (63)	1.57 (40)	1.27 (21)	.98
Laissez-faire	1.48 (62)	1.43 (40)	1.15 (21)	.89

Peers

Transformational	2.36 (38)	2.25 (20)	2.47 (11)	.22
Contingent Reward	2.11 (38)	2.24 (20)	2.52 (11)	.63
Contingent Punishment	2.06 (38)	2.26 (20)	2.26 (11)	1.51
Noncontingent Punishment	1.78 (38)	1.63 (20)	1.16 (11)	1.31
Laissez-faire	1.65 (38)	1.44 (20)	1.24 (11)	.80

NOTE: Specific sample sizes for each comparison are in parentheses

Table 14

A Mean Comparison of Cadets in Three Peer Ranking Groups on Leadership Measures at Time 4

Rater Group/Leader Behavior

<u>Subordinates</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	<u>F</u>
Transformational	2.42 (35)	2.58 (39)	2.61 (48)	.52
Contingent Reward	2.36 (35)	2.66 (39)	2.73 (48)	1.39
Contingent Punishment	1.93 (35)	2.47 (39)	2.34 (48)	5.75**
Noncontingent Punishment	1.80 (35)	1.43 (39)	1.51 (48)	1.20
Laissez-faire	1.61 (34)	1.28 (39)	1.38 (48)	1.03

Superiors

Transformational	2.21 (17)	2.42 (27)	2.42 (23)	.32
Contingent Reward	2.11 (17)	2.17 (27)	2.34 (23)	.75
Contingent Punishment	1.86 (17)	2.17 (27)	2.27 (23)	1.39
Noncontingent Punishment	1.44 (17)	1.65 (27)	1.69 (23)	.25
Laissez-faire	1.86 (17)	1.31 (27)	1.45 (23)	1.62

NOTE: Specific sample sizes for each comparison are in parentheses
** p < .01

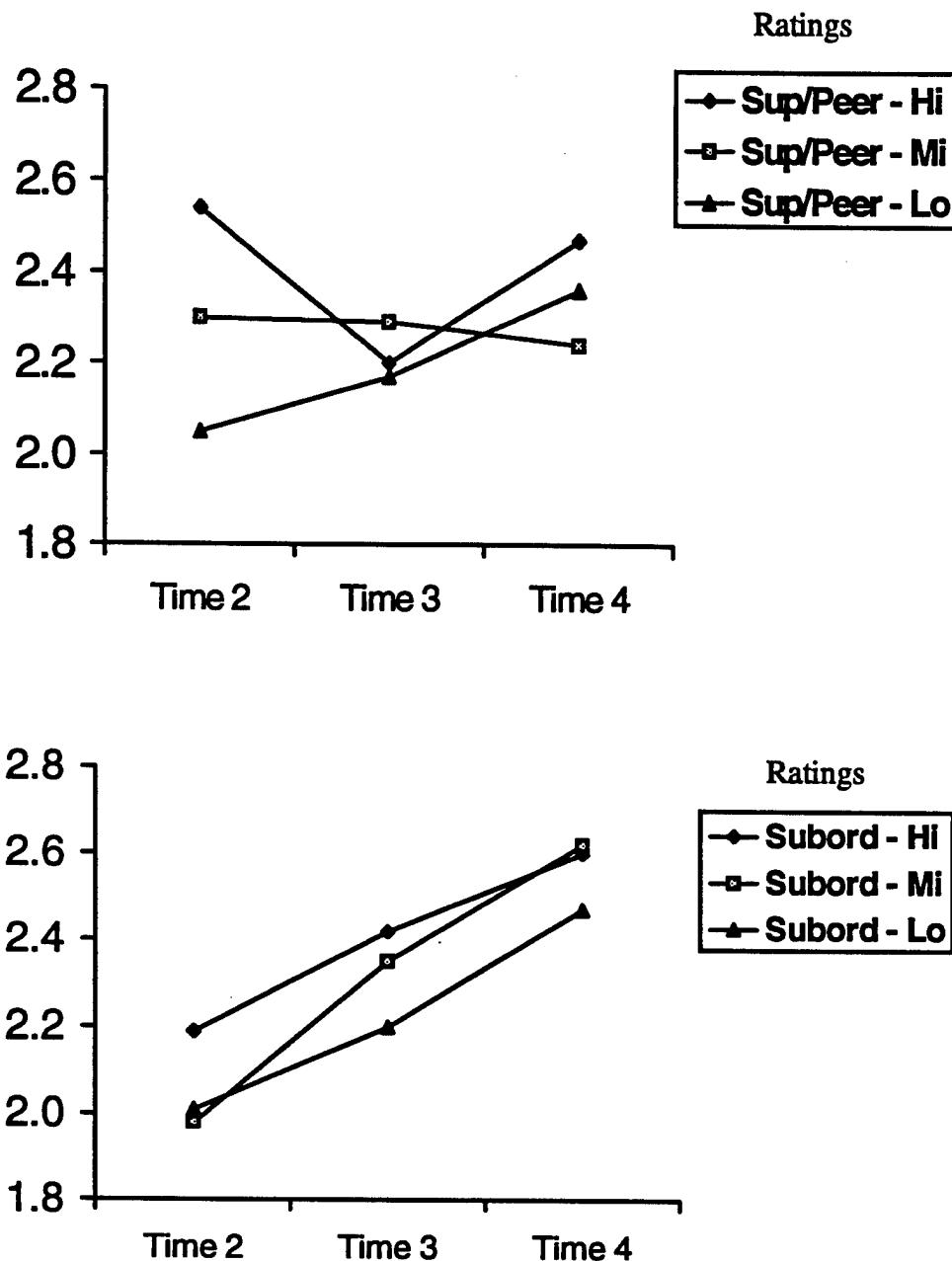


Figure 9 Transformational Leadership Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Senior Rank Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

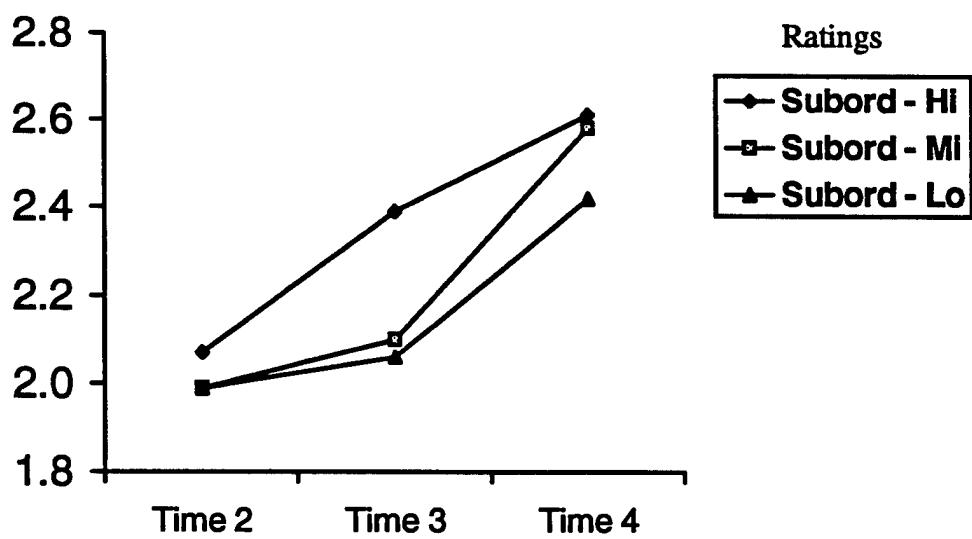
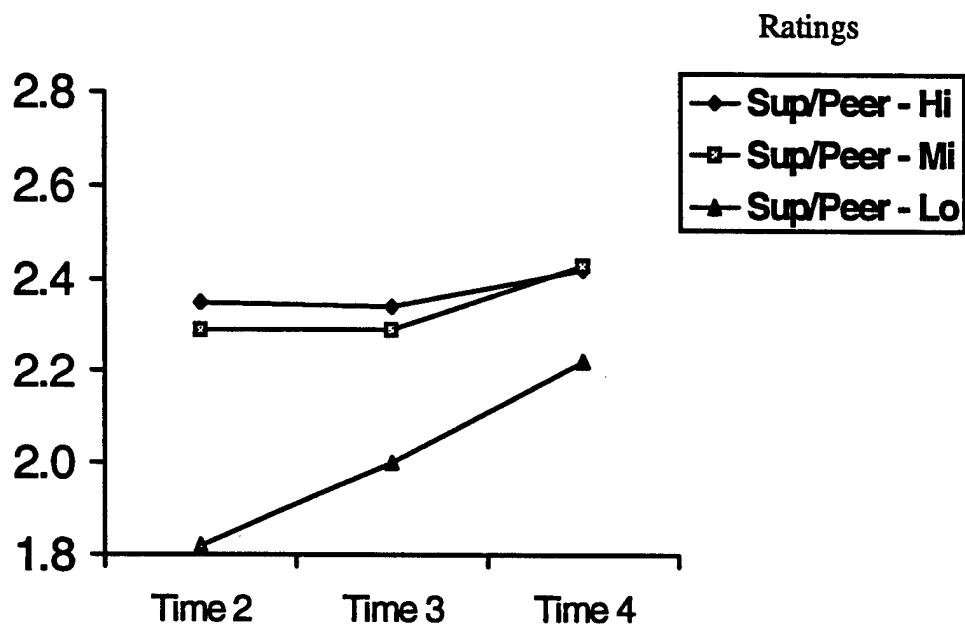


Figure 10 Transformational Leadership Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Peer Ranking Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

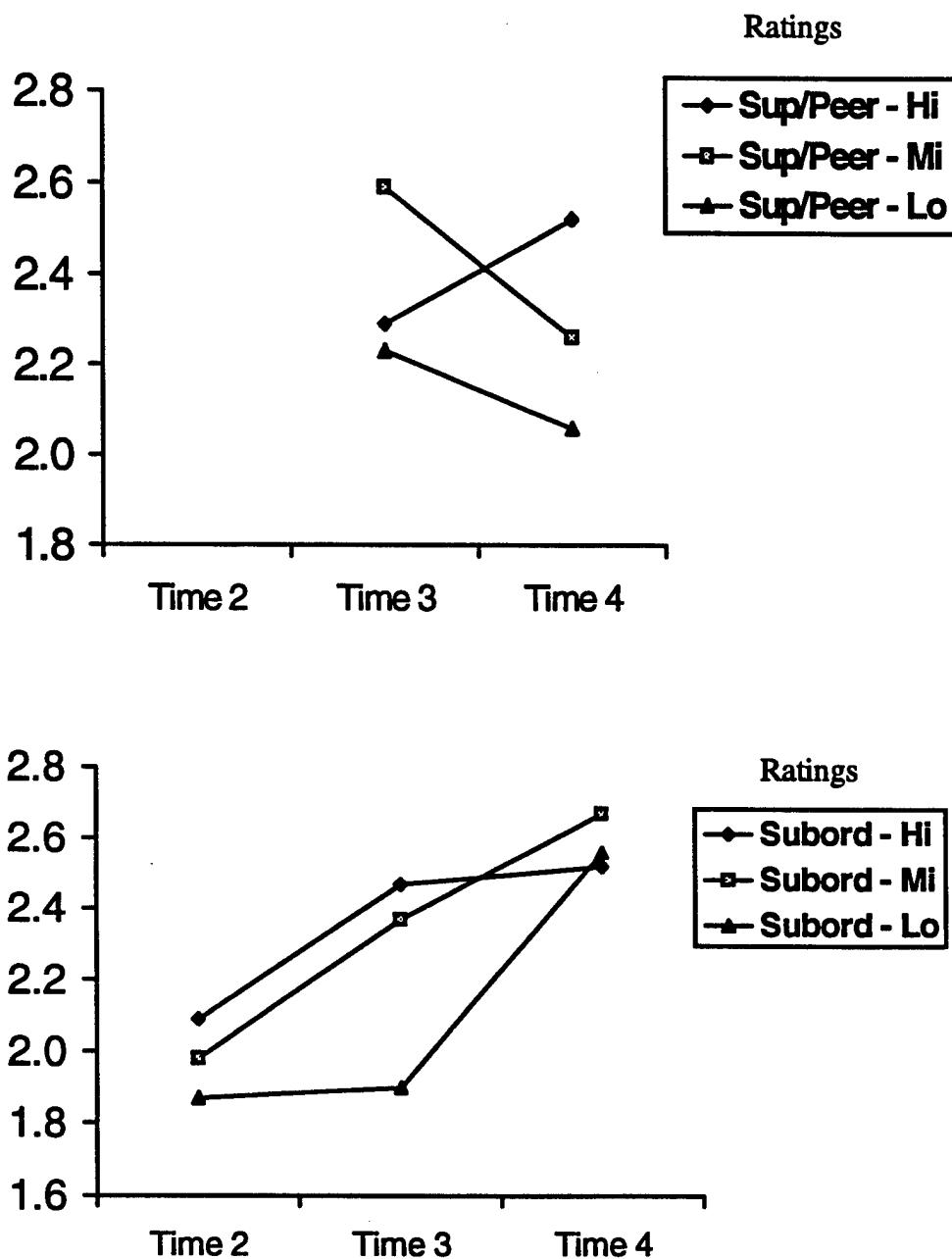


Figure 11 Contingent Reward Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Senior Rank Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

reward. Superior (peer) ratings differed significantly at Time 3, with those in the middle group rated highest on contingent reward (see Table 11).

Figure 12 shows the trends in contingent reward ratings for the high, middle, and low peer ranking groups. Most obvious is the direct upward trend in subordinate ratings between Times 2, 3 and 4. Between Times 2 and 4 and Times 3 and 4, those in the high peer rank group significantly increased on subordinate ratings of contingent reward. Also apparent are the consistently lower subordinate scores for those in the low peer ranking group compared to those in the high peer ranking group. These differences were significant at Time 3 (see Table 12). Superior (peer) ratings changed little between Times 3 and 4, and showed no dramatic differences between those in the high and low groups.

Figure 13 shows the pattern of ratings on contingent punishment. Two patterns are particularly noteworthy. First, those rated lowest by subordinates at Times 2 and 3 were those who held the lowest rank at Time 4, while those who attained the highest rank received the highest ratings of contingent punishment at Times 2 and 3. These differences were not significant at Time 2 (see Table 9), but were at Time 3 (see Table 11). Also apparent, between Times 3 and 4, the subordinate scores on contingent punishment increased significantly for the low and middle senior rank groups, indicating that the focal cadets holding low and middle ranks as seniors were more likely to deliver contingent punishment than they had been earlier in their careers at VMI.

The ratings of contingent punishment presented in Figure 14 for those in the high, middle, and low peer ranking groups indicate a pattern similar to the results seen in Figure 13. For example, subordinate ratings at Time 2 were highest for the cadets in the high peer ranking group, and generally, subordinate ratings of contingent punishment increased over time. However, the only significant increases were from Time 3 to Time 4 for the middle group and from Time 2 to Time 3 for the high group. Contingent punishment as rated by superiors decreased somewhat, though not significantly for any particular group over time.

Figure 15 presents the results for noncontingent punishment ratings over time as a function of senior rank group. Interestingly, the pattern of superior ratings is quite different from that shown for contingent punishment. Specifically, between Times 3 and 4, scores the focal cadets received for noncontingent punishment from superiors went up somewhat for those in the middle and low groups. Also, those in the high senior rank group received significantly lower scores on noncontingent punishment than those in the low rank group from subordinates at Time 3 (see Table 11).

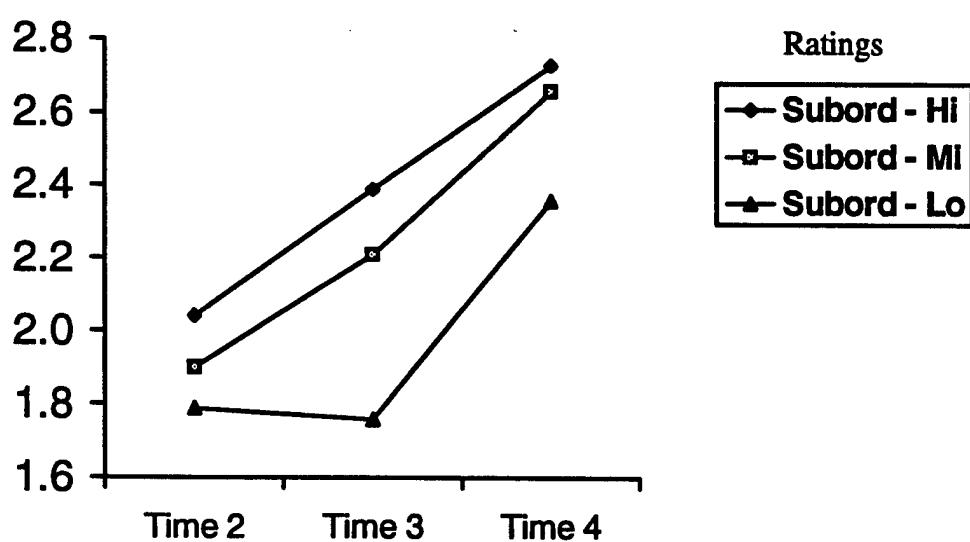
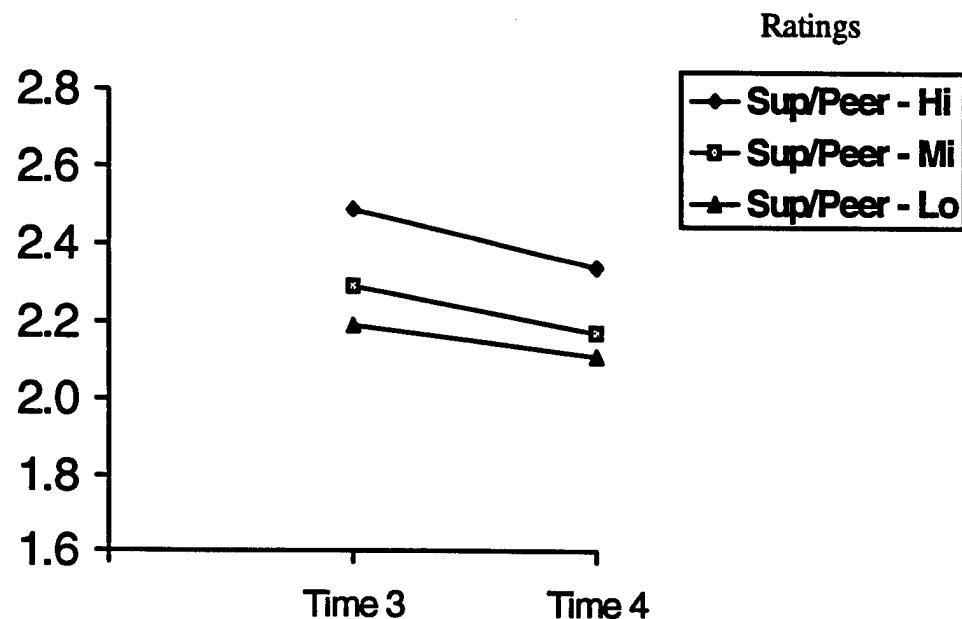


Figure 12 Contingent Reward Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Peer Ranking Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

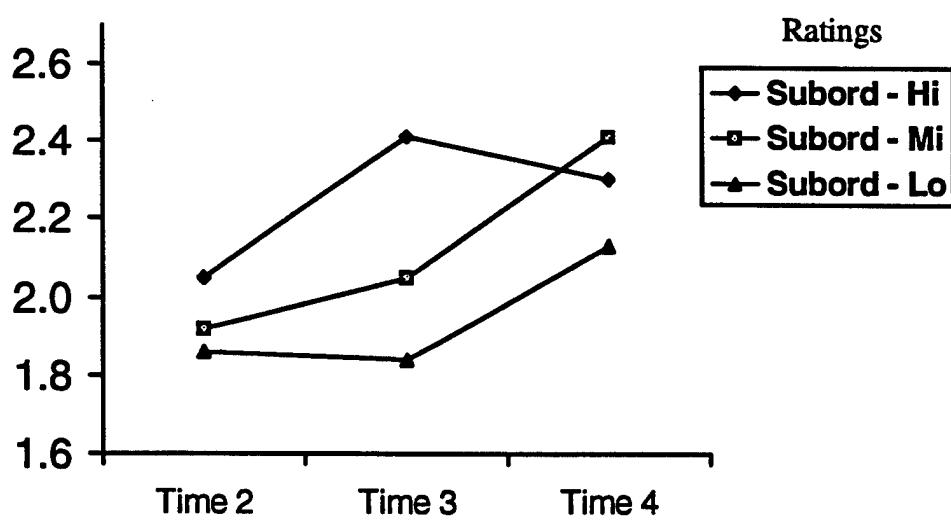
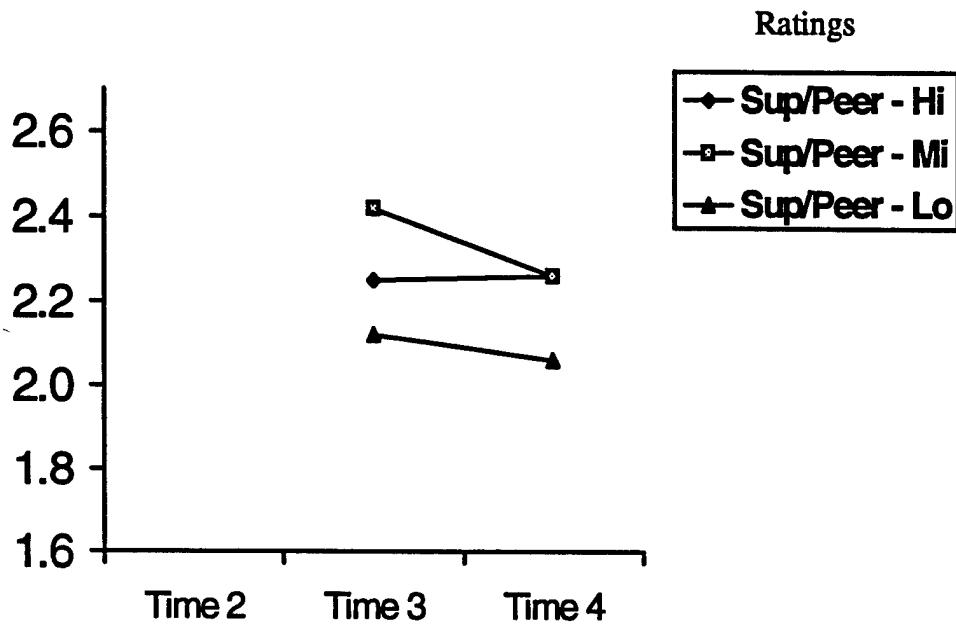


Figure 13 Contingent Punishment Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Senior Rank Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

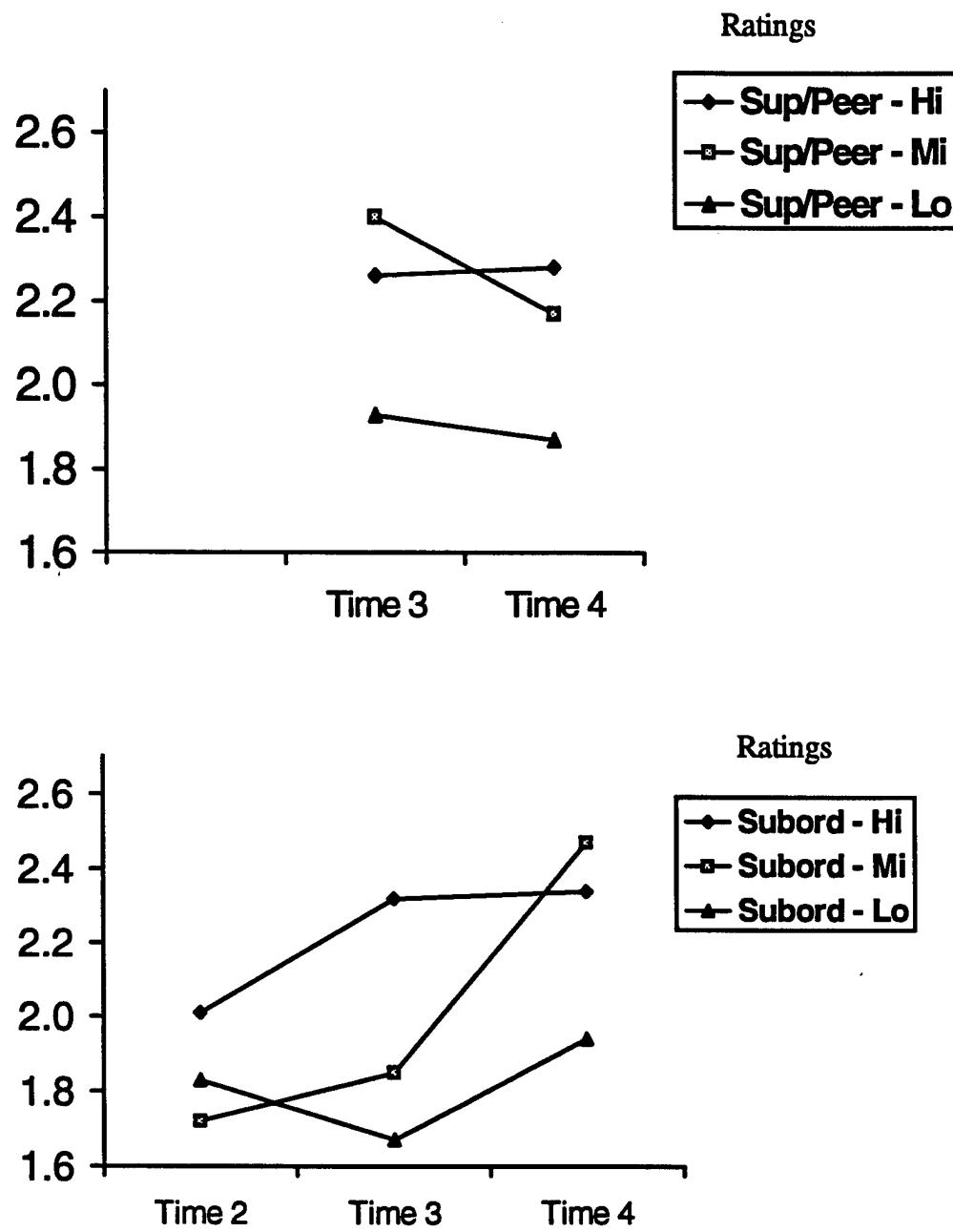


Figure 14 Contingent Punishment Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Peer Ranking Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

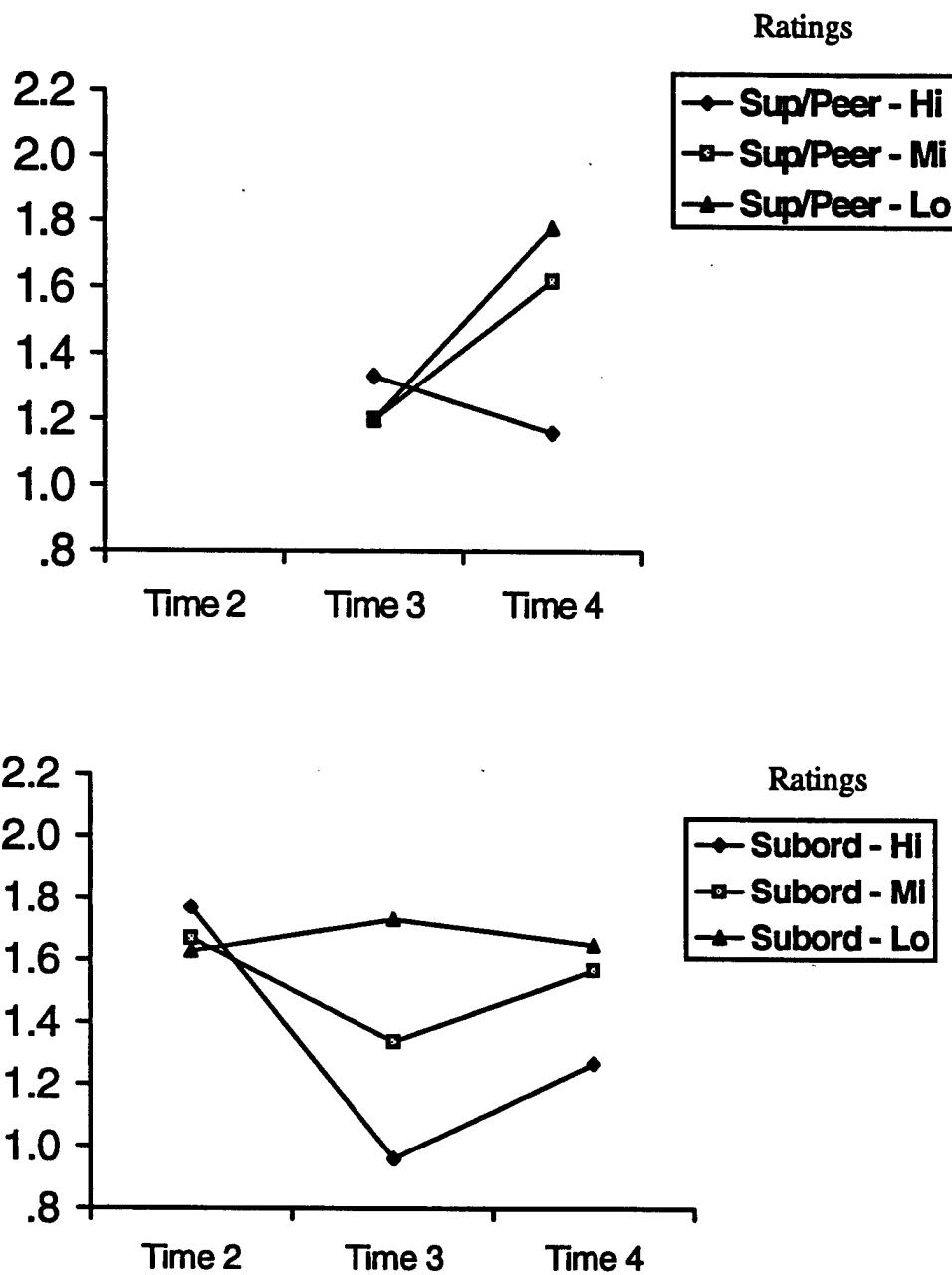


Figure 15 Noncontingent Punishment Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Senior Rank Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

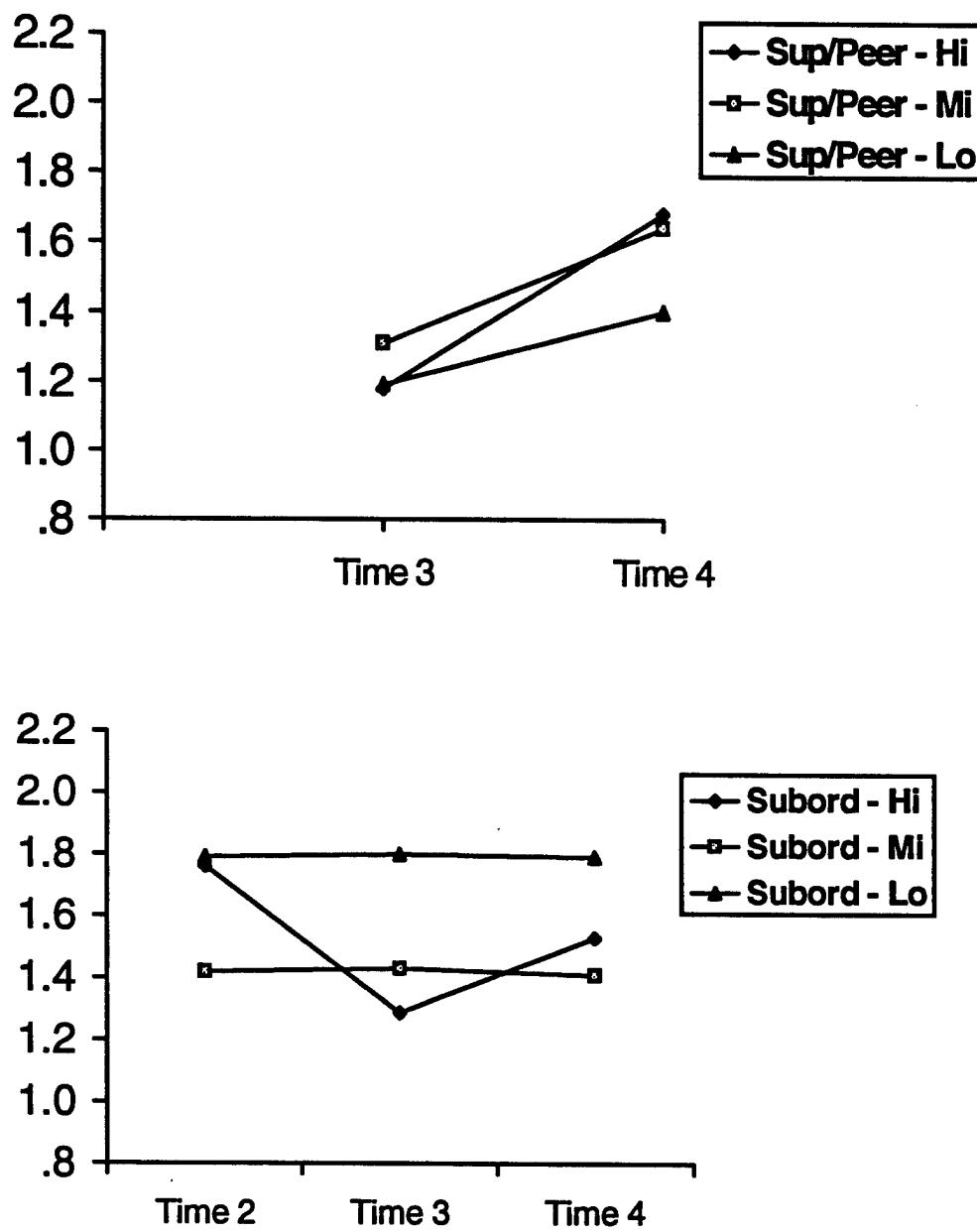


Figure 16 Noncontingent Punishment Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Peer Ranking Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

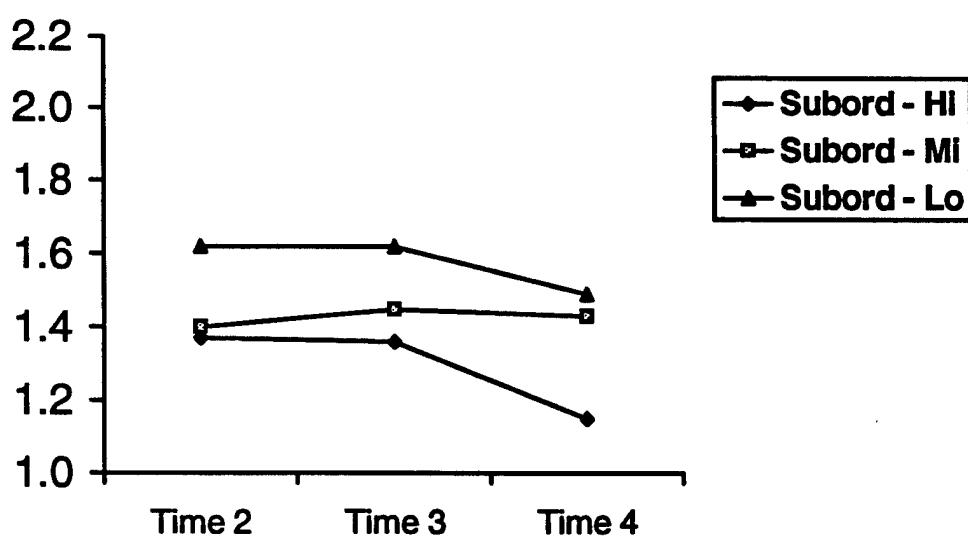
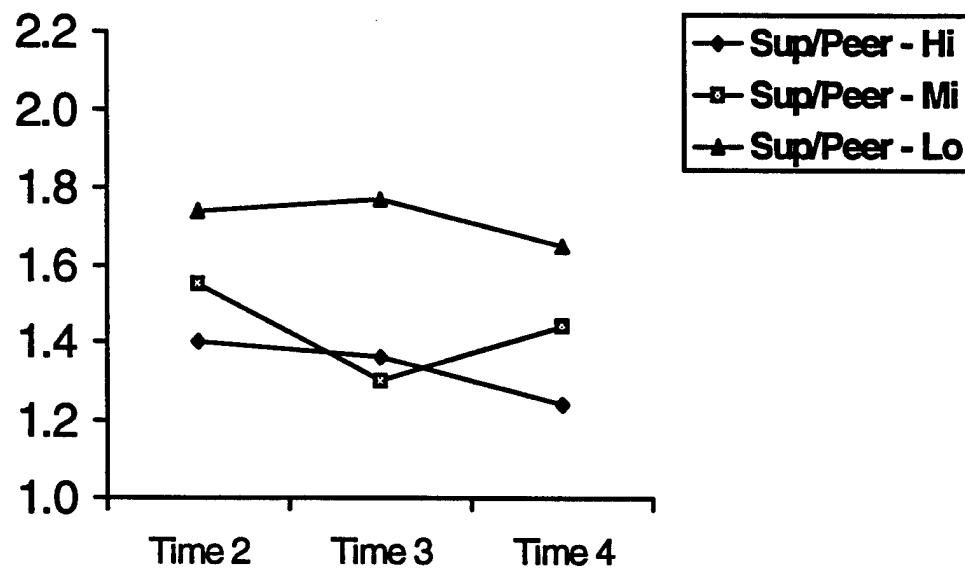


Figure 17 Laissez-faire Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Senior Rank Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

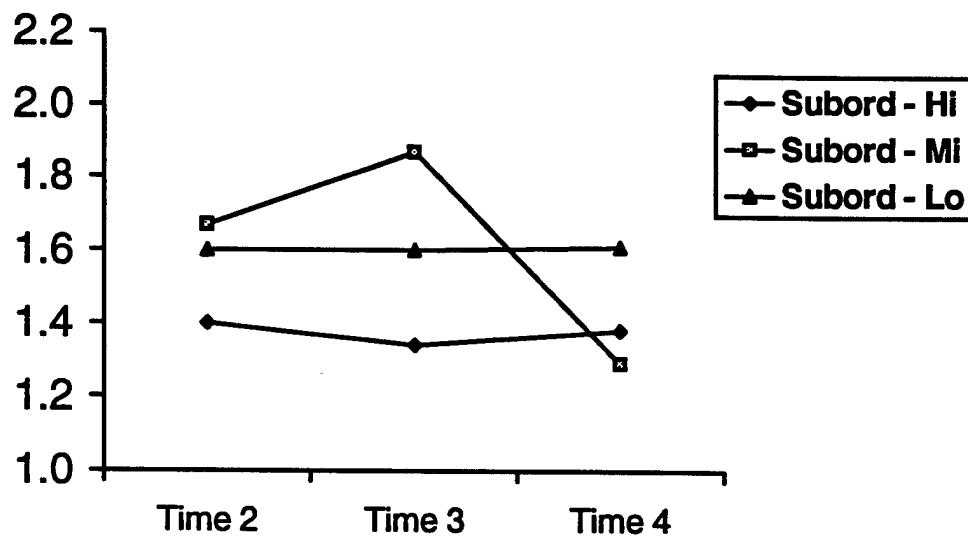
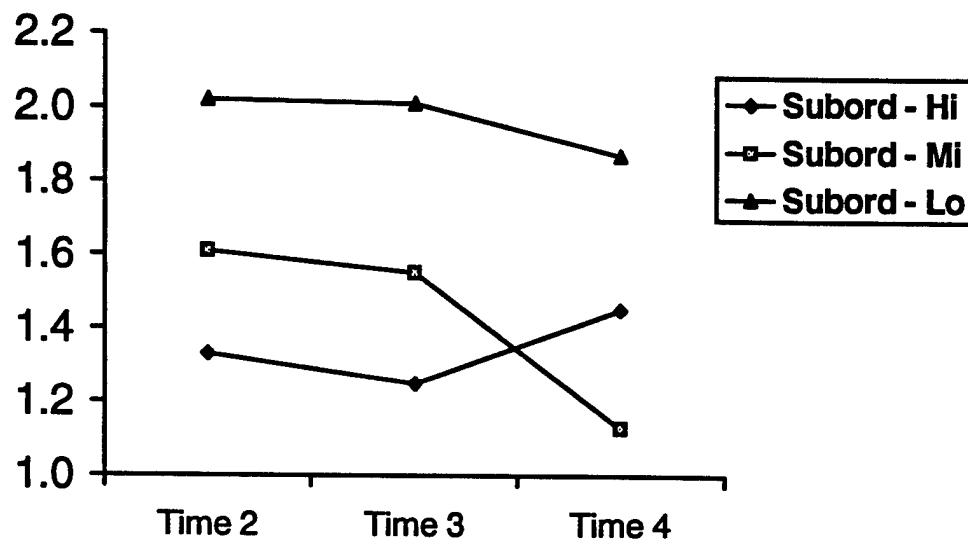


Figure 18 Laissez-faire Ratings by Superiors and Subordinates of Cadets in High, Middle, and Low Peer Ranking Groups Over Time

Note: At Time 4 peers provided ratings instead of superiors

Table 15

Regression Analyses: Ratings of TF, CR, LF, CP, NCP^b by Subordinates and Superiors (Peers) at Two Time Periods Predicting Senior Rank and Peer Rankings

	Senior Rank		Peer Rankings	
	F	B	F	B
Time 2^c				
Subordinate TF	.11	-.01	.168	.09
Subordinate CR	.08	.07	126	.18
Subordinate CP	.09	-.06	126	.13
Subordinate NCP	.12	.13*	125	.03
Subordinate LF	-.17*	-.12*	164	-.17*
Superior TF	.24**	.15*	133	.34***
Superior LF	-.21**	-.13*	137	-.33***
Multiple R = .29**		Multiple R = .34***		
R ² = .08**		R ² = .12***		
Time 3^d				
Subordinate TF	.11	.06	134	.17
Subordinate CR	.28**	.05	125	.31**
Subordinate CP	.27**	.15*	125	.34***
Subordinate NCP	-.27**	-.16*	124	-.31***
Subordinate LF	-.13	-.07	135	-.18
Superior TF	.05	-.05	128	.20*
Superior CR	.08	.04	155	.16
Superior CP	.09	.06	157	.11
Superior NCP	.03	.07	154	-.02
Superior LF	-.20*	-.15*	128	-.34**
Multiple R = .35***		Multiple R = .42***		
R ² = .12***		R ² = .17***		

^a = p<.10; ^{*} = p<.05; ^{**} = p<.01; ^{***} = p<.001

^b TF = Transformational Leadership; CR = Contingent Reward
CP = Contingent Punishment; NCP = Noncontingent Punishment

^c LF = Laissez faire

^d Focal cadets were sophomores; subordinates were freshmen; superiors were juniors and seniors
d Focal cadets were juniors; subordinates were sophomores; superiors were seniors

predictors. Subordinate ratings of contingent reward and noncontingent punishment were significantly correlated with peer rankings but did not account for unique variance. Those engaging in more contingent punishment, more contingent reward, less noncontingent punishment and less laissez-faire leadership were most likely to receive higher peer rankings.

DISCUSSION

Due to the nature of the data collection, all cadets were not measured at each time period. As such, the data are not purely longitudinal. We did, however capture data on a significantly large sample at each time and thus have made some causal inferences over time. These inferences should be considered in light of the quasi-longitudinal nature of the data.

Individual Differences as Predictors of Leader Effectiveness

The results presented above indicate that individual differences are predictive of leader effectiveness, in some instances over a four-year time span. Physical fitness was highly predictive of leader effectiveness at each time period, and self-esteem and hardiness also were relevant to effectiveness. In this context, physical fitness likely is associated with a set of personality variables that are indicative of conscientiousness or perseverance, and self-confidence. In support of this, physical fitness was significantly positively correlated with self-esteem, hardiness and conscientiousness. As such, it may not be merely physical fitness, but the mental and physical strength that it represents that predicts leadership effectiveness.

Also interesting regarding physical fitness was the upward trend over time, indicating that the cadets, particularly those holding rank, continued to increase their fitness levels. They did not become complacent over time and slack off in terms of physical conditioning. However, the most improvement occurred during the first two years.

Self-esteem also significantly predicted the focal cadets' rank attained in Year 4. Those cadets who were more sure of themselves and had more positive opinions of themselves were more likely to emerge among those holding rank than those with lower self-esteem. Interestingly, self-esteem was not significantly related to the peer rankings of effectiveness. This may reflect a tendency for those leaders who display modesty or who underrate themselves relative to ratings provided by others to receive higher ratings of effectiveness by others (see Atwater & Yammarino, in press). In other words, those who present themselves as less cocky or confident are no less admired or

respected by their peers than those with higher degrees of self-esteem.

Surprisingly, and contrary to expectations, self-esteem scores overall did not increase from Time 1 to Time 4, and in looking at Figures 3 and 4, even showed a slight drop, or downward trend for some groups. This may have been a result of realizing one's limitations, or perhaps due to fears and apprehensions associated with graduation.

Hardiness was expected to distinguish more and less effective leaders. Hardiness was, in fact, related to senior rank at Times 2, 3, and 4, and though not a significant predictor of peer rankings, those in highest senior rank and peer ranking groups generally had higher hardiness scores (see Figures 5 and 6). As indicated above, the development of hardiness or stress tolerance among cadets was an important part of VMI's training mission. The pressures placed on cadets in terms of time, and physical and emotional conditioning were such that stress tolerance was essential, and those with lower levels of hardiness likely left the Institute. However, it is interesting to note that at Time 4, similar to the scores on self-esteem, hardiness scores tended to drop relative to what they were at Time 3. This could have been due to the apprehension associated with graduation, or with leaving the protection of the Institute.

The results for moral reasoning were somewhat perplexing in that the most effective leaders were not those scoring highest on moral reasoning. In fact, at Time 3 when means on moral reasoning differed significantly for the peer ranking groups, those in the low peer ranking group scored higher than those in the high peer ranking group. One possible explanation for this finding is that leadership at VMI requires individuals to "buy into the system" and those with higher moral reasoning scores are less likely to do this. Perhaps those at the higher moral reasoning levels questioned the validity of using punishment for development. According to Kohlberg (1981), individuals at the highest stages of moral development are less likely influenced by social pressures, or society's norms, and instead develop their own moral code or standards of conduct. This high stage of moral reasoning may have been somewhat incompatible with leading in the military structure at VMI.

The comprehensive list of individual differences, when used as a set of predictors of leader effectiveness (see Table 8) accounted for 11 percent of the variance in senior rank and 10 percent of the variance in peer rankings. Many of the individual difference variables measured in Year 1 accounted for significant portions of variance in the levels of rank attained in Year 4. Cognitive ability, physical fitness, prior influence experiences, and moral reasoning each accounted for significant portions of unique variance. Cognitive ability, BIOLEAD, physical fitness,

prior influence experiences, conscientiousness, self-esteem and the leader potential index were all significantly correlated with senior rank. This suggests that indeed, individual differences can predict who will later emerge as leaders. Consistent with earlier research (cf. Lord et al., 1986) cognitive ability was associated with leadership. Also consistent with previous findings, conscientiousness was a significant correlate (cf. Bentz, 1990). These results significantly add to our understanding of leader effectiveness in that in this study, the individual variables were measured years before leader effectiveness was assessed and therefore are likely predictors of who will later emerge as a leader.

In terms of predicting peer rankings, only physical fitness and prior influence experiences were significant unique predictors. Self-esteem, measured at Time 1 was marginally significantly correlated with peer rankings. Nevertheless, the combination of individual differences accounted for 10 percent of the variance in peer rankings. This is a notable finding in that the individual differences were measured almost four years prior to obtaining the peer rankings of leader effectiveness. This again suggests that we can, on the basis of individual differences, predict to some extent who will become the most effective leaders.

It is interesting that the individual difference measures were more predictive of senior rank, overall, than they were of peer rankings. This may be indicative of the error (such as friendship bias) that enters when peer ratings or rankings are used as the criterion, compared to more objective indicators such as attaining a position. Or it may suggest that individual differences are more predictive of who will assume formal positions of leadership than how leaders are perceived by their peers.

In summary, these findings suggest that it may be possible to create selection batteries that can help predict who will be the best leader candidates. Similar to selection procedures at the U.S. Naval Academy where a weighted regression score, based on empirically derived weights, is used to assist in admission decisions, individual difference variables also could be used, in combination with other variables, to help select leaders who have a greater than average chance of being effective.

Leader Behaviors as Predictors of Leader Effectiveness

Subordinates' ratings of transactional leadership at Time 3 (i.e., contingent reward and contingent punishment) were significantly related to leader effectiveness. In each case, the relationships were positive. This suggests that as discussed above, contingent behaviors on the part of the leader may improve

follower performance such that others recognize the leader as one who is effective. Unfortunately, however these leaders may not be learning that noncontingent behaviors are less effective, given that noncontingent punishment did not decrease over time. Transformational leadership, particularly as rated by superiors at Time 2 was significantly and positively related to leader effectiveness, while ratings of laissez-faire leadership were significantly negatively related to effectiveness.

When looking at the patterns of leader behavior over time in Figures 9 - 18, a number of notable patterns were apparent. First, regarding transformational leadership, those leaders who were least effective were seen as using less transformational leadership behaviors than more effective leaders by superiors at Time 2. A similar conclusion can be drawn about contingent reward. Generally, contingent reward behavior was rated lowest by subordinates at Time 2 and by subordinates and superiors at Time 3 in those leaders who did not subsequently hold rank, and who received the lowest peer rankings. This suggests that the leaders perceived as least effective were not engaging in contingent reward or transformational behaviors when they were most actively training the freshmen. The least effective leaders used the highest amounts of noncontingent punishment as rated by their subordinates in Years 3 and 4, and were also those generally rated as most laissez-faire by their subordinates each year. This is the typical pattern suggested by Bass (1985) and others indicating that transformational and transactional behaviors will be effective and nontransactional behaviors will be ineffective.

Contingent punishment as rated by subordinates declined somewhat from Time 3 to Time 4 for those leaders holding the highest ranks yet increased for those in the middle and low rank groups. The noncontingent punishment behaviors rated by superiors and peers surprisingly showed a slight increase from Time 3 to Time 4 for most groups as rated by superiors and then peers. It is not surprising that contingent punishment would decline for the most effective leaders in Year 4, but it is surprising that noncontingent punishment would increase. This may be due in part to the increasing role the seniors play in training the freshmen, where a good deal of noncontingent punishment is demonstrated.

In summary, we have identified some predictive relationships between individual characteristics and leadership effectiveness and between leadership behaviors and subsequent leadership effectiveness. These findings generally support the available cross-sectional studies of leader traits and behaviors. However, the relationships found between transformational leadership and effectiveness were disappointing and inconsistent with earlier cross-sectional studies. Perhaps the military training context, or the early stage of leadership development (i.e., young

leaders) made transformational behaviors less noticeable to subordinates or less relevant to effectiveness.

Implications

This study demonstrated that leadership effectiveness could be predicted by individual difference variables and leader behaviors measured years before the effectiveness criteria were assessed. The most important individual difference predictors were physical fitness, self-esteem, cognitive ability, prior influence experiences and conscientiousness. These findings are consistent with those reported by Avolio et al. (1996), in that a similar set of predictors predicted transformational leadership, which has been documented as the most effective type of leadership in numerous studies (cf. Hater & Bass, 1988; Bass & Avolio, 1993).

Regarding leadership behaviors, again, behavior measured years before effectiveness criteria were assessed were predictive of leader effectiveness. Specifically, transformational leadership behaviors as well as contingent reward and punishment were positively related to leader effectiveness, while noncontingent punishment and laissez-faire leadership were negatively related. These findings confirm cross-sectional studies (where leader behavior and effectiveness were measured simultaneously). These findings suggest that leaders should be encouraged to treat subordinates contingently, that contingent punishment is conducive to effectiveness in a military environment, and that noncontingent punishment or inactive, laissez-faire leadership are counter-productive. These findings have implications for military leadership training. Transformational leadership training, as well as training in how to effectively deliver contingent rewards and punishments could increase military leader effectiveness.

The findings regarding developmental trends in this study also were noteworthy. In terms of individual differences, physical fitness continually improved over time, and moral reasoning ability also increased. However, while self-esteem and hardiness fluctuated over time, they did not increase from Time 1 to Time 4. These findings may reflect the pattern desired by those conducting military training, that is, the individuals learn to identify their strengths and weaknesses, and these results reflect that pattern. In other words, they came in with unrealistic self-assessments, and have now improved and become more realistic. On the other hand, these results may reflect a trend that indicates that military training (at least in this one environment) is not accomplishing all of its purposes as it had hoped. Individuals are not leaving the military training environment with higher self-reported self-esteem or hardiness than that with which they entered. These results suggest that

future research should address the individual outcomes of military training to determine if it is, in fact, having its intended effects.

With respect to changes in leader behaviors over time, generally transformational leadership behaviors increased over time, suggesting that leaders are learning more effective behaviors. Consistent with this, the use of contingent reward also increased while noncontingent punishment decreased somewhat over time for the most effective leaders, suggesting that leaders may be discovering that they can use more transformational and positive behaviors in lieu of noncontingent punishment.

Also, while not a specific purpose of this study, it is interesting to note the differences in the patterns of leadership ratings from superiors and subordinates. Clearly, these two groups are not observing, experiencing, or interpreting leader behavior similarly. This has implications for leadership evaluations and could be the subject of future military research.

Limitations

Our ability to collect complete data on the entire class was a limitation in this study. At the outset, we were unaware of the difficulties we would encounter in getting the cadets to complete surveys. In part, we erred because we burdened the cadets with too many surveys, administered too often, and we did not clearly recognize the many other burdensome survey requests made of cadets by various functions at VMI.

A second limitation was our inability to obtain reliable measures of leadership behavior with methods other than surveys. We collected both critical incident and observational data but were unable to use it as we did not have comparable measures on all aspects of leadership on all cadets.

The inability to replicate findings regarding the strong link between transformational leadership and effectiveness was surprising. Perhaps the demands placed on leaders for transactional leadership and noncontingent punishment in this type of indoctrination environment precluded the demonstration of transformational leadership behaviors cadets would have exhibited in a less restrictive environment. Or perhaps, the context blurred the distinction between transactional and transformational leadership behaviors. In fact, the positive correlations between contingent reward and contingent punishment and transformational leadership (see Avolio et al. 1996) suggests this may have occurred.

Nevertheless, we believe this study added value in that we were able to trace patterns of behaviors over time and link individual difference measures to leadership effectiveness.

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APPENDIX A
SCORING OF PEER RANKINGS

SCORING OF PEER RANKINGS

Each cadet was asked to rank the top five and bottom five members of his company within his class in terms of leadership effectiveness. This resulted in every member of the company having a frequency distribution of how many times he was ranked best, second best, third best, fourth best, fifth best, and worst, second worst, third worst, etc.

For example, in a company with twenty-seven focal cadets, a cadet could have been ranked best once, second best three times, third best twice, fourth best not at all, and fifth best once. He also could have been ranked worst, second worst and third worst not at all, but been ranked fourth worst once and fifth worst twice. In this scenario, the cadet was ranked at various points in the top five or bottom five by nine of the twenty-seven cadets in his company. The remaining eighteen cadets did not rank him as a member of the top five or bottom five, so for the purposes of analysis it was assumed that they ranked him in exactly the middle of the company, thirteenth. When a cadet has no ranking in one of the top five or bottom five spots -- such as the above example, where no one ranked the cadet fourth best, or worst, second or third worst -- the frequency for this score is zero and is figured into the final peer ranking in that way.

In order to compute the cadet's final peer ranking score, the cadet's top ranking, bottom ranking, and middle ranking must first be computed. His top ranking is computed by multiplying the frequency with which he is ranked best through fifth best by one through five, respectively. Thus, in the case of our example, one is multiplied by one, three is multiplied by two, two is multiplied by three, and one is multiplied by five. These are then added together, and in the case of the example yield 18. This is the cadet's top ranking score.

The cadet's bottom ranking is determined by the size of his company. In the case of the example, a ranking of worst would mean the cadet is twenty-seventh in a company of twenty-seven, second worst means he is twenty-sixth, third worst means he is twenty-fifth, fourth worst means he is twenty-fourth, and fifth worst means he is twenty-third in a company of 27. In the example the cadet was ranked fourth worst once and fifth worst twice, so one is multiplied by twenty-four and two is multiplied by twenty-three. These are then added together, and in this case yield 70. This is the cadet's bottom ranking score.

The cadet's middle ranking is computed by multiplying the middle point of the company by the number of cadets who did not rank the cadet in either the top five or the bottom five. In the example, the middle point of the company is thirteen, and the number of cadets who did not rank the cadet in either the top

five or the bottom five is eighteen. Thus, this cadet's middle ranking is 234.

The top ranking, bottom ranking, and middle ranking are added together to get a cadet's raw peer ranking. This means that each cadet gets one peer ranking score which is an additive score based on the number of his peers that ranked him in the top, bottom or middle (unranked). In the example, this total is 322. Two things are important to note because of the way this raw score is computed. First, by this method, the top ranked cadets have low scores and the bottom ranked cadets have high scores. Second, because of the fact that this raw score is dependent upon company size, it can be used as a comparison within companies, but not between companies.

For intuitive ease, and so that peer rankings could be compared between companies, two additional steps were taken. First, the raw peer rankings were converted to z-scores for each separate company. This standardization procedure allows for the comparison of peer ranking across companies, and this transformation now yields rankings which are all between approximately 2.5 and -2.5. The second step is reversing these z-scores so that a lower score reflects a lower ranking and a higher score reflects a higher ranking. All of the succeeding statistical analyses using the peer rankings were done with these reversed z-scores.

APPENDIX B
T-TESTS OF MEAN DIFFERENCE

T-tests of Mean Differences (Individual Differences)

Physical Fitness Scores		t-values by Groups			
Time <u>Periods</u>	<u>Variable</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>	
1-2	Senior Rank	- 9.48** (131)	-6.41** (48)	-1.35 (9)	
1-3	Senior Rank	-10.16** (126)	-7.66** (49)	-3.23** (9)	
1-4	Senior Rank	- 5.43** (110)	-6.10** (42)	-5.37** (8)	
2-3	Senior Rank	- 3.04** (134)	-2.48** (51)	-1.94* (11)	
2-4	Senior Rank	- .88 (115)	-2.00* (43)	-2.58* (9)	
3-4	Senior Rank	.89 (111)	.10 (44)	-1.21 (9)	
1-2	Peer Rank	- 5.28** (57)	-8.05** (73)	-5.00** (57)	
1-3	Peer Rank	- 6.19** (49)	-8.87** (72)	-6.84** (56)	
1-4	Peer Rank	- 4.15** (45)	-5.26** (63)	-5.42** (56)	
2-3	Peer Rank	- 1.90* (52)	-2.61** (77)	-3.44** (58)	
2-4	Peer Rank	- 1.24 (48)	-1.27 (65)	-2.60** (59)	
3-4	Peer Rank	.29 (46)	.59 (64)	- .71 (58)	
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Self-Esteem Scores					
1-2	Senior Rank	1.72* (113)	- .23 (41)	-1.84 (9)	
1-3	Senior Rank	1.76* (108)	.95 (44)	- .27 (9)	
1-4	Senior Rank	1.71* (78)	.02 (36)	- .95 (5)	
2-3	Senior Rank	- .06 (86)	.69 (35)	- .64 (7)	
2-4	Senior Rank	1.26 (59)	-1.18 (27)	N/A (<5)	
3-4	Senior Rank	.11 (60)	- .12 (32)	N/A (<5)	
1-2	Peer Rank	.15 (47)	.57 (61)	- .05 (53)	
1-3	Peer Rank	- .17 (46)	2.27* (65)	- .12 (49)	
1-4	Peer Rank	.16 (39)	1.10 (51)	.50 (35)	
2-3	Peer Rank	.09 (34)	.29 (52)	- .35 (43)	
2-4	Peer Rank	.47 (28)	.54 (38)	- .23 (29)	
3-4	Peer Rank	.82 (30)	- .35 (43)	- .41 (28)	
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Hardiness Scores					
1-2	Senior Rank	1.25 (108)	-1.47 (42)	-1.72 (9)	
1-3	Senior Rank	- 1.78* (107)	-1.00 (47)	-1.13 (9)	
1-4	Senior Rank	.14 (76)	-1.00 (38)	-1.53 (5)	
2-3	Senior Rank	- 2.51** (85)	.61 (35)	1.27 (7)	
2-4	Senior Rank	1.24 (57)	- .37 (27)	N/A (<5)	
3-4	Senior Rank	2.29* (60)	- .42 (32)	N/A (<5)	
1-2	Peer Rank	- .88 (46)	1.81* (61)	-1.17 (52)	
1-3	Peer Rank	- 1.11 (46)	-2.20* (68)	- .62 (48)	
1-4	Peer Rank	- 1.27 (39)	.54 (52)	- .86 (35)	
2-3	Peer Rank	- .41 (33)	-2.66** (52)	- .18 (43)	
2-4	Peer Rank	1.19 (27)	- .95 (37)	1.40 (29)	
3-4	Peer Rank	1.14 (30)	1.29 (43)	.08 (28)	

Moral Reasoning Scores

t-values by Group

<u>Time Periods</u>	<u>Variable</u>	<u>Low</u>	<u>Middle</u>	<u>High</u>
1-3	Senior Rank	- 1.95* (88)	-2.38* (37)	- .17 (7)
1-4	Senior Rank	- 1.91* (40)	-1.79* (14)	N/A (<5)
3-4	Senior Rank	- .33 (30)	- .01 (13)	N/A (<5)
1-3	Peer Rank	- 1.25 (38)	-3.50** (49)	-1.29 (40)
1-4	Peer Rank	- 1.90* (16)	-1.83* (21)	-1.95* (23)
3-4	Peer Rank	.05 (14)	- .73 (14)	- .63 (21)

* p < .10

* p < .05

** p < .01

Note: Sample sizes are in parentheses next to t-values

T-tests of Mean Differences (Leadership)

Transformational Scores			t-values by Groups				
<u>Time</u>	<u>Periods</u>	<u>Rater</u>	<u>Variable</u>		<u>Low</u>	<u>Middle</u>	<u>High</u>
			Subordinate	Senior Rank			
2-3	Subordinate	Senior Rank	-1.80*	(59)	-2.57* (30)	.00	(8)
2-4	Subordinate	Senior Rank	-2.54**	(46)	3.48** (35)	-.28	(7)
3-4	Subordinate	Senior Rank	-1.45	(37)	-.17 (28)	-1.00	(7)
2-3	Superior	Senior Rank	-.33	(47)	1.04 (19)	2.02	(5)
2-4	Superior	Senior Rank	-2.05*	(19)	-.01 (14)	.61	(7)
3-4	Superior	Senior Rank	-1.27	(17)	.35 (9)	.00	(6)
2-3	Subordinate	Peer Rank	-1.64	(22)	-.67 (27)	-2.13* (43)	
2-4	Subordinate	Peer Rank	-2.20*	(24)	-2.59* (30)	-3.25** (41)	
3-4	Subordinate	Peer Rank	-1.11	(19)	-1.29 (18)	-.82	(41)
2-3	Superior	Peer Rank	-.17	(19)	.82 (25)	.65	(21)
2-4	Superior	Peer Rank	-.62	(9)	-.29 (16)	-1.02	(14)
3-4	Superior	Peer Rank	-1.03	(5)	-1.06 (14)	-.76	(15)
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Contingent Reward Scores							
2-3	Subordinate	Senior Rank	-.14	(39)	-.75 (22)	-1.31	(8)
2-4	Subordinate	Senior Rank	-3.31**	(36)	-1.81* (25)	-.53	(6)
3-4	Subordinate	Senior Rank	-4.26**	(34)	-.02 (23)	1.70	(7)
2-4	Superior	Senior Rank	-.64	(21)	.79 (17)	-.26	(8)
2-3	Subordinate	Peer Rank	-.13	(16)	-.35 (17)	-1.80* (35)	
2-4	Subordinate	Peer Rank	-1.82*	(20)	-1.57 (19)	-3.54** (37)	
3-4	Subordinate	Peer Rank	-1.22	(16)	-1.02 (20)	-2.17* (37)	
3-4	Superior	Peer Rank	-.25	(6)	-.36 (19)	-.47	(21)
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Contingent Punishment Scores							
2-3	Subordinate	Senior Rank	.17	(39)	-.54 (22)	-.83	(8)
2-4	Subordinate	Senior Rank	-.71	(36)	-1.33 (25)	.15	(6)
3-4	Subordinate	Senior Rank	-2.84**	(34)	-1.07 (23)	.50	(7)
3-4	Superior	Senior Rank	.22	(22)	.21 (17)	-.27	(8)
2-3	Subordinate	Peer Rank	.62	(16)	.03 (17)	-2.01* (35)	
2-4	Subordinate	Peer Rank	.68	(20)	-1.45 (19)	-1.62	(37)
3-4	Subordinate	Peer Rank	-1.41	(16)	-2.90** (20)	-.23	(37)
3-4	Superior	Peer Rank	.70	(7)	.41 (19)	-.60	(21)

T-tests of Mean Differences (Leadership)

Noncontingent Punishment Scores			t-values by Groups				
Time	Periods	Rater Variable	Low	Middle	High		
	2-3	Subordinate Senior Rank	-.38 (38)	.69 (22)	1.72 (8)		
	2-4	Subordinate Senior Rank	-.10 (35)	1.32 (25)	1.43 (6)		
	3-4	Subordinate Senior Rank	.27 (34)	-.53 (23)	-2.13* (7)		
	3-4	Superior Senior Rank	-1.63 (21)	-1.77* (17)	.77 (8)		
	2-3	Subordinate Peer Rank	-.48 (16)	-.23 (18)	2.05* (35)		
	2-4	Subordinate Peer Rank	.54 (20)	-.18 (18)	1.64 (37)		
	3-4	Subordinate Peer Rank	-.32 (16)	.01 (20)	-.58 (37)		
	3-4	Superior Peer Rank	1.25 (16)	-1.35 (19)	-1.46 (21)		
Laissez-faire Scores			t-values by Group				
	2-3	Subordinate Senior Rank	.53 (57)	-1.48 (31)	.69 (8)		
	2-4	Subordinate Senior Rank	.19 (46)	-.10 (35)	-.01 (7)		
	3-4	Subordinate Senior Rank	1.15 (36)	-.34 (28)	.41 (7)		
	2-3	Superior Senior Rank	-.26 (48)	1.24 (18)	-.60 (5)		
	2-4	Superior Senior Rank	1.23 (19)	-.57 (14)	.47 (7)		
	3-4	Superior Senior Rank	-.54 (17)	-2.47* (9)	-.30 (6)		
	2-3	Subordinate Peer Rank	1.17 (21)	-1.50 (26)	.05 (42)		
	2-4	Subordinate Peer Rank	-.74 (24)	1.10 (30)	-.02 (41)		
	3-4	Subordinate Peer Rank	-.97 (18)	2.93** (18)	-.09 (41)		
	2-3	Superior Peer Rank	-1.40 (20)	-.01 (24)	.35 (21)		
	2-4	Superior Peer Rank	.01 (8)	.35 (16)	.75 (16)		
	3-4	Superior Peer Rank	-.75 (5)	-.01 (14)	-2.03* (15)		

* p < .10

* p < .05

** p < .01

Note: Sample sizes are in parentheses next to t-values.